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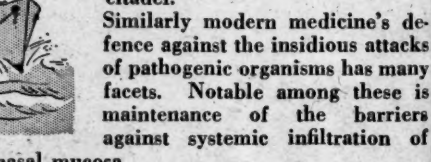

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INFECTIOUS MONONUCLEOSIS

WITH AN ACCOUNT OF AN EPIDEMIC IN AN E.M.S. HOSPITAL

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In August, 1942, an epidemic of infectious mononucleosis, presenting some unusual features, was discovered in an E.M.S. hospital, and was also apparently widespread in surrounding districts. During the past few years interest in infectious mononucleosis has increased and many articles have been published. The condition was reviewed in a most comprehensive manner by Bernstein in 1940 and again by Smeall in 1942. Paul and Bunnell, by their discovery in 1932 that the serum of patients with this disease contains an antibody which agglutinates sheep's red cells in high dilution, did much to establish it as a separate entity. The disease may vary in severity from cases with symptoms so mild as to pass unrecognized to an acute illness with severe sore throat, glandular enlargement, and pyrexia, followed by a long period of debility and frequent exacerbations.

Diagnosis

The clinical manifestations are protean, and diagnosis on clinical grounds alone may be almost impossible; examination of a blood smear and a Paul-Bunnell test, however, will soon confirm diagnosis. Tidy, in his papers on this subject, has dealt thoroughly with the clinical manifestations. He subdivides the disease into three groups—anginose, glandular, and febrile types. In the glandular type the onset is usually characterized by slight pyrexia, frontal headaches, and pain and stiffness at the back of the neck. The first glands to be enlarged are usually those in the posterior triangles, often on the left side, and later all other groups of glands may be involved. Glandular enlargement may persist for many months after all other symptoms have disappeared. Tidy states that in about half the cases the spleen is also involved. The anginose type may closely simulate severe acute tonsillitis or diphtheria. Vincent's organisms are often the predominant flora obtained from the throat. The febrile type occurs more commonly in adults, and is characterized by a fairly sharp onset with severe frontal headache and stiffness of the neck. Rashes may occur with this type and may raise the suspicion of typhoid fever, especially if there is splenic enlargement (Tidy, 1934). Morbilliform and scarlatiniform rashes also occur. In this type, glandular enlargement may not be present until late in the disease and toxaemia and weakness may be prominent features. With all three types various complications may arise: red cells and albumin may be found in the urine; epistaxis and purpuric eruptions have been described (Downey and McKinlay, 1923). In some cases the symptoms referable to the central nervous system may be so severe as to simulate meningitis, and in some there is an increased cell count in the C.S.F. with definite meningitic signs. These cases may closely simulate acute lymphocytic meningitis—here again the Paul-Bunnell test is of great value in differentiation.

Jaundice has been described in infectious mononucleosis, and in these cases catarrhal jaundice may be closely simulated, especially as the blood pictures are not unlike. Bernstein suggests that some cases of catarrhal jaundice with enlarged spleens are probably cases of infectious mononucleosis.

Serological Diagnosis

The Paul-Bunnell reaction is of great value in establishing the diagnosis of infectious mononucleosis. There is, however, much dispute in the literature regarding the titre which can be accepted as diagnostic of the condition. Tidy (1939) regards a titre of 1:64 as specific, but other writers do not accept a titre of less than 1:256 unless the absorption test is also positive. Paul in 1941 stated that a titre of 1:64 is nearly always of diagnostic value, while a titre of 1:32 is suggestive of it. Smeall (1942) gives the results of Paul-Bunnell tests performed on 765 patients not suffering from infectious mononucleosis or serum sickness; in 66.8% of these no agglutination was observed, while only 0.4% gave a titre of 1:64. Barrett in 1941 tested the sera of 100 normal healthy people and found only 4 with a titre of 1:40; none exceeded this figure. Paul and Bunnell in their original work found that 273 control cases gave only low titres. The Paul-Bunnell test may become positive very early in the disease, but in some cases a positive result is not obtained for three to four weeks. In view of this it is essential that in a suspected case of infectious mononucleosis repeated Paul-Bunnell tests be done, as a single negative reaction does not rule out this diagnosis. In cases with a low titre the absorption test is useful to distinguish the infectious-mononucleosis antibody. It has been found that sera from cases of infectious mononucleosis contain antibodies which are absorbed by ox cells but not by guinea-pig kidney. Sheep-cell agglutinins occurring in serum from normal people are absorbed by guinea-pig kidney but not by ox cells, while the agglutinins found in the sera of cases treated with horse serum are absorbed by both the ox cells and the guinea-pig kidney (Barrett, 1941).

In cases of infectious mononucleosis in which the Paul-Bunnell titre does not rise above 1:32 this absorption test is of great value. The Paul-Bunnell reaction may remain positive for many weeks after clinical manifestations of the disease have disappeared.

The Blood Picture

Great care in the study of blood films is necessary in establishing a diagnosis of infectious mononucleosis. It is well known that the characteristic finding is a relative and absolute increase of the lymphocytic series of cells. Tidy (1934) states that the total white count ranges between 6,000 and 15,000 per c.mm.; in many instances, however, the count has greatly exceeded this figure. Rarely, the disease may be ushered in by a leucopenia. Paul (1939) noted that in about half his cases leucopenia was a feature. Tidy mentions that the polynuclear cells often show a shift to the left, and he draws attention to the statement that the eosinophils may be low or absent during the acute stage and increased above normal during convalescence. Tidy also mentions the initial polynucleosis at the onset of the disease. It is, however, in the mononuclear cells that striking changes occur: these cells often constitute 60% and upwards of the total white count (Bernstein, 1940). Bernstein comments on the fact that mononucleosis occurs more commonly in sporadic cases than in the epidemics, and he attributes this to the fact that only the more obvious cases of the sporadic type are recognized, while in a known epidemic slight changes in the blood are looked for and found.

The mononuclear cells in infectious mononucleosis may be divided into three groups: Group 1, normal lymphocytes; Group 2, monocytes; Group 3, abnormal or atypical lymphocytes. Groups 1 and 2 correspond to cells found in normal blood. The atypical lymphocytes show great variation in morphology; they vary in size and shape, and the nucleus may be oval, indented, or show lobulation. Nuclear chromatin often shows fenestration. Downey in 1923 divided abnormal lymphocytes into three types: Type 1 corresponds to the cell described above, and in Type 2 cells the chromatin of the nucleus is not so condensed and the cytoplasm does not show vacuolation; Type 3 cells resemble those of acute lymphatic leukaemia, the nucleus possessing nucleoli and a basophilic cytoplasm. It is generally agreed that the erythrocytes and the platelets are not affected in infectious mononucleosis, and bleeding and coagulation times are normal. The blood picture typical of infectious mononucleosis is characterized by a relative and absolute lymphocytosis and the presence of abnormal lymphocytes.

Many writers describe cases of infectious mononucleosis in which serological tests for syphilis have been positive. Bernstein states that 18% of his cases were serologically positive for syphilis, while Radford and Rolleston drew attention to this phenomenon in 1930. Paul in 1939 described several cases in which a positive Wassermann reaction was obtained. Kahn in 1939 drew attention to the fact that these false positive serological tests for syphilis may persist for several months.

The Marrow

Freeman in 1936 found an increase in lymphocytes and sometimes a slight shift to the left of the myeloid leucocytes in marrow from cases of infectious mononucleosis. Israëls in 1941 found, in a few cases he examined, that the marrow showed an increase in plasma cells and abnormal lymphocytes; Vogel and Bassen in 1939, however, in four cases found no change in the marrow. Sternal puncture would certainly help to differentiate between acute lymphatic leukaemia and infectious mononucleosis.

Pathology of Lymph Glands

All authors agree that there is marked hyperplasia of lymphoid and reticulo-endothelial cells. Pratt in 1931 described great hyperplasia of the reticulo-endothelial cells. Downey and Stasney referred to similar pathological findings in 1936. Longcope in 1922 gave an essentially similar picture. The gland architecture is maintained, and the abnormal lymphocytes found in peripheral blood can be demonstrated throughout the glands (Gall and Stout, 1940).

The changes found in lymph glands are not diagnostic, and could be confused with any non-specific adenitis, although biopsy of a lymph gland would readily differentiate between infectious mononucleosis and more serious conditions such as lymphatic leukaemia and lymphadenoma.

Most epidemics of infectious mononucleosis have occurred among children. Tidy and Morley (1921) reckoned that 85% of epidemic cases of this disease occurred in children under 12 years of age. Nolan in 1935 described an epidemic resembling infectious mononucleosis in which only 5 cases out of 220 were in adults. The Paul-Bunnell titres in his cases ranged from 1:80 to 1:320, and most of the cases appeared to be mild. Most epidemics of infectious mononucleosis have occurred in hospitals and institutions. The incubation period usually varies from 5 to 11 days. Boyd (1940) states that studies of apparently healthy medical students during an epidemic show that many mild cases probably pass undiagnosed. Reyersbach and Lenert (1941) describe 16 cases among 108 children who were receiving convalescent treatment after rheumatic fever. None of these 16 cases showed symptoms or signs; the blood picture was apparently typical, although the predominating cell was the small lymphocyte and the Paul-Bunnell reaction was negative. Smith (1941) describes leucocytosis with absolute lymphocytosis occurring in children without symtoms or signs of disease being manifest.

Description of the Epidemic

The epidemic described below differs in many respects from those previously recorded. The age incidence was from 20 to 45 years; the outbreak occurred in a selected population, mainly young soldiers who, although in hospital, were relatively fit. The disease was distributed equally between males and females. Two older cases may be specially mentioned here: one was that of a woman aged 84 who had no clinical manifestations of the disease, but had a Paul-Bunnell reaction of 1:128 and a mononucleosis of 65%; the other was that of a woman aged 64 who had no clinical manifestations, a negative Paul-Bunnell reaction, but a very typical blood picture with a mononucleosis of 48%. These patients were the oldest observed. The incubation period in our cases varied from 5 to 10 days; in one instance it was exactly 5 days.

The most interesting feature of the epidemic was the occurrence of cases without clinical manifestations. In many instances the Paul-Bunnell antibody was present along with the typical blood changes—i.e., a relative and absolute mononucleosis with abnormal lymphocytes present in the peripheral blood—but clinical manifestations were completely lacking.

The first case to be detected in this outbreak was that of a woman aged 25, admitted to the hospital on Aug. 5, 1942, with a typical attack of severe anginose infectious mononucleosis. She had a mononucleosis of 83% and her Paul-Bunnell reaction was positive at 1:340. Four other cases were also admitted to the medical unit early in August. On Aug. 12 one of the male medical staff who was in close attendance on the first patient began to suffer from symptoms of the disease, although he made no special comment until Aug. 23, when he had generalized glandular enlargement. From Aug. 12 onwards many members of the nursing and medical staff began to suffer from moderately severe symptoms of infectious mononucleosis, and cases also occurred among the other patients. As the infection seemed to be widespread, blood films were examined from all patients in the unit at this time, with the astonishing result that every one was found to have a blood picture typical of infectious mononucleosis, although many were symptom-free. On Aug. 26 it was decided to take sample blood films from wards in other units of the hospital, and these again showed a blood picture typical of the disease. As a great number of the staff and patients were now complaining of symptoms it was decided to close the hospital to admissions from Aug. 28, and a thorough investigation was made into the outbreak. At this time 273 patients in the hospital were examined clinically for symptoms and signs of infectious mononucleosis and, so far as time permitted, serial Paul-Bunnell tests were done, together with blood examinations. In addition, members of the medical and nursing staffs were investigated, making the total 296. The result revealed that 97.9% of those investigated showed evidence of the infection. In only 6 instances could the infection be completely excluded; these presented no symptoms or signs and had normal blood pictures with low titres or negative Paul-Bunnell reactions. Of the 296 persons investigated at this time 125 were clinical cases of infectious mononucleosis, and 165 had blood and serological changes but no clinical manifestations of the disease. In addition, relatives of the medical and nursing staffs living outside the hospital developed clinical manifestations of the disease which were quite well marked. Previous epidemics of infectious mononucleosis have been described, but none appears to have reached the high percentage of positive cases present in this epidemic. It would seem that the infectivity was very high, or else the hospital and surrounding districts were subjected to a very heavy dosage, perhaps due to black-out conditions.

Cases can be subdivided into groups according to the highest titre of the Paul-Bunnell test.

TABLE I.—*296 Cases, plus 23 in which no Paul-Bunnell Tests were Done*

Distribution of Cases	Paul-Bunnell End Titre						Paul-Bunnell not Done, but Blood Picture Typical
	1:512	1:256	1:128	1:64	1:32	Negative at 1:32	
Medical unit ..	7	9	25	24	5	3	—
Aver. W.B.C. ..	10,900	6,600	10,900	9,400	9,900	9,900	
„ mononuc.	49%	49%	46%	47%	44%	52%	
Orthopaedic unit	4	12	34	52	49	27	20
Surgical unit ..	0	6	16	13	8	2	3
Cases with clinical manifestations ..	9	15	40	40	16	5	—
Total cases ..	11	27	75	89	62	32	23

The cases in the medical unit include members of the nursing and medical staffs. Of the six cases which were entirely negative, five were in the orthopaedic unit and one in the surgical unit. All six negative cases had Paul-Bunnell titres of 1:32 or less. In Table I 23 additional cases are shown: these cases had no Paul-Bunnell tests, but their blood pictures were characteristic. The surgical unit is closely adjacent to the medical unit, in which infection was most severe; the main part of the orthopaedic unit is 1,000 yards away from the medical unit. All the surgical staff of the surgical and orthopaedic units had clinical manifestations of the disease.

As the infection seemed widespread in the hospital it was decided to use as a control groups of cases elsewhere, and Dr. E. Neil Reid, County M.O.H., kindly gave us facilities to examine cases in centres at varying distances away. The first group—19 A.R.P. workers—examined was in a town closely adjacent. Paul-Bunnell tests, white blood counts, and differential counts were done on all of them. Of these 19 cases (Table II, Group A), 7 were in close contact with the hospital, and most of the others had opportunities to contact its personnel. A further control group (B) was examined in a town about 5 miles from the hospital, this being the place from which the first severe anginose case was admitted. Group C was drawn from an A.R.P. group in a town about 13 miles and Group D from a small country village about 20 miles from the hospital. In addition, the Department of Health for Scotland arranged for a control group (E) in another E.M.S. hospital about 35 miles distant, and we are indebted to the Department for the results shown in Table II.

TABLE II.—*Results of Control Investigations*

Group	No. of Cases	Paul-Bunnell Titre					Blood Picture		Clinical Manifestations	
		1:256	1:128	1:64	1:32	Negative at 1:32	Pos.	Neg.	Pos.	Neg.
A & B	37	6	12	7	8	3	37	—	2	35
C & D	35	—	1	3	10	21	4	31	2	33
E ..	20	—	—	—	—	20	—	20	—	20

Clinical Features

Clinically, cases can be divided into four groups:

1. *Latent Cases.*—Cases with a relative or an absolute mononucleosis with abnormal lymphocytes present and a positive Paul-Bunnell reaction, but in which there were no symptoms or signs of the disease.

2. *Mild Cases.*—Cases with symptoms and signs, but not so severe as to lead to abstention from duty, or would not have done so if the patient had not already been in hospital with some other complaint.

3. *Moderate Cases.*—Similar to Group 2, but with severer symptoms and patient confined to bed for a day or two.

4. *Severe Cases.*—Patients more seriously ill, and diagnosis found difficult.

Symptomatology

Headache.—This was present in 92 cases and was severe; it was frontal in distribution, intermittent in character, and tended to recur daily for several days. Pain behind the eyes was often severe, and a mild conjunctivitis was present in a fair number of cases.

Stiff Neck.—Common, and probably due to the enlarged glands. Definite nuchal rigidity was observed in two cases.

Mental Symptoms.—These occurred in 31 cases, and consisted of slight confusion, inability to concentrate, transient forgetfulness, lassitude, and insomnia.

Pyrexia.—This was not a feature except in anginose cases. In one case pyrexia was the only feature, and continued for many days before glands became enlarged. Another glandular case had pyrexia without the illness.

Polyuria with Lumbar Pain.—Occurred in 34 cases. The urinary findings were negative except in anginose cases in which red cells and albumin were present in the urine.

Glands.—The lymphatic glands were enlarged in nearly all cases, although enlargement had sometimes to be sought for carefully. The glands were fleshy and usually tender, and the groups most frequently involved were in the posterior triangles of neck and axillae, although many cases had generalized glandular enlargement, often including the epitrochlear glands. Glandular enlargement was intermittent, with a tendency to frequent relapses. In cases from which glands were removed for biopsy it was noted that healing was very slow although no sepsis was present. In one case healing occurred only after blood transfusion, but was then rapid. Whitby and Britton (1939) state that glands should not be excised.

Spleen.—Splenic enlargement was present in about 30 cases, but many others had pain and tenderness in the left hypochondrium. In one case the spleen reached to below the umbilicus.

Rashes.—These were observed in 10 cases. (*a*) Maculo-papular—seen in 3 cases. In two cases the rash began between the scapulae and spread on to the front of chest and abdomen, later spreading to the upper part of arms and legs. In these two cases there was no rash on the hands, legs, or face. In the third case the rash started in the front of the body and spread round to the back and on to the flexor aspects of the arms. These three cases could have been confused with secondary syphilis, as sore throat and generalized glandular enlargement were a feature. However, the W.R. was negative, the Paul-Bunnell titre was positive at 1:256 or over, and the blood pictures were quite typical. The rashes occurred early, usually on the first or second day. (*b*) Scarlatiniform and morbilliform rashes were seen in the remaining 7 cases, and these rashes were very transient. (*c*) One case with a purpuric rash on the legs and thighs was observed.

Jaundice.—This was not seen during the epidemic, but the icteric index and the van den Bergh test, done on 15 of the severer cases, showed that 8 had latent jaundice. One case admitted after the hospital reopened had fairly severe jaundice, serum bilirubin 6 mg. per 100 c.cm., and a Paul-Bunnell titre of 1:128 with a positive absorption reaction.

Sore Throat.—Present in 35 cases. The fauces were injected, but only 4 true anginose cases were seen.

Alimentary Symptoms.—Transient diarrhoea was present in 13 cases in the early stage of the disease. Vomiting was also present, and in a few cases vomiting and diarrhoea were severe. Repeated examinations of the faeces for pathogenic organisms in these cases were negative.

Thoracic Symptoms.—Observed in many cases, and often raised the suspicion of pleurisy or pneumonia. Pain in the chest, aggravated by respiration and accompanied by cough, was the main symptom. Clinical and radiological examination of these patients was negative. It seems likely that the symptoms were due to enlarged mediastinal glands, although this was not confirmed on fluoroscopy.

Meningitic Cases.—In 5 cases meningitic symptoms were severe enough to warrant lumbar puncture. In 4 of these cases the C.S.F. pressure was high, and three of these four had a cell count above 5 per c.mm., while the one with normal cell count had an increase in protein. In the fifth case the C.S.F. was normal in every respect.

Epistaxis.—Observed in 4 cases.

One case was observed in which the salivary glands were enlarged; the blood picture was typical and the Paul-Bunnell titre 1:128. Six cases with parotid enlargement were described by Glanzmann in 1930.

In most cases the symptoms subsided completely within 5 to 21 days, but a few went on for longer periods, with relapses, and two were still having relapses after six months.

The Wassermann, Kahn, and flocculation tests were done in many cases during the epidemic and were consistently negative, irrespective of the titre of the Paul-Bunnell; thus the results differed from those obtained by other workers. In 6 cases recently observed by us in which the absorption test for the glandular fever antibody was positive, the W.R. and the flocculation test were negative throughout the course of the disease. In two of these recent cases the Paul-Bunnell titre exceeded 1:2000.

The Paul-Bunnell Test

During the first three weeks of the epidemic about 1,000 Paul-Bunnell tests were done, and in these circumstances it was impossible to put up the serum in dilutions greater than 1:512. The patients' sera were inactivated at 55° C. for 15 minutes, and dilutions of the sera ranging from 1:32 to 1:512 were set up; to these 0.5 c.cm. of 1% suspension of washed sheep red cells was added. The tubes were then placed in the incubator for one hour and afterwards left in the refrigerator all night. After shaking gently two or three times they were read by naked eye, according to the method of Paul and Bunnell. Any result about which there was the least doubt was regarded as negative. Unfortunately, at the time the epidemic was in progress it was not possible to do absorption tests to prove the presence of the true glandular fever antibody. However, one of the patients seen during the epidemic returned to hospital in the middle of December, and the Paul-Bunnell reaction on this occasion was positive 1:32, and the absorption test, using guinea-pig kidney and ox cells, was positive (Barrett, 1941). Much has been written about the diagnostic titre in the Paul-Bunnell reaction. We agree with Tidy that a titre of 1:64 is practically diagnostic. We think a titre of 1:32 is suggestive and is an indication for repetition of the test in a few days' time. In many of our cases the first two or three Paul-Bunnell tests, performed at intervals of 5 to 7 days, were negative at 1:32, and thereafter gradually rose to significant or diagnostic titres. The titres observed in this epidemic are low compared with those of sporadic cases, but are much higher than titres obtained in control groups of cases not suffering from infectious mononucleosis and described by other writers. In our series of 296 cases 202 had titres of 1:64 or over—a finding quite unlike anything previously described on controls done on normal people. It is strong evidence of the presence of some infective agent which has greatly increased the heterophile antibody response in our cases; when coupled with the clinical findings and the blood picture the evidence that the disease present was infectious mononucleosis is almost certain.

The Blood

Blood changes in infectious mononucleosis have been considered very thoroughly by various authors, and the changes found in this epidemic were much in accordance with previous descriptions.

In our series the total white count varied from 8,000 to 20,000, but only a few cases had counts of 20,000. Many had leucopenia fairly early in the disease, as found by Tidy, by Longcope, and by Davidsohn (1937). An initial polymorphonucleosis was seldom observed in this epidemic. In most of our cases the polymorphs showed a shift to the left, and stab cells were often seen; many of the polymorphs showed toxic granulation. Early in the disease we observed that eosinophils were absent; but later on, as recovery ensued, they returned in proportions greater than normal. An unusual feature was an increase in basophils, these ranging from 1 to 3% in a fairly early stage of the disease.

The platelet count and coagulation time (Lee and White) were unaffected. Anaemia was not a feature: one case of hypochromic anaemia occurred in a young adult male; this responded rapidly to iron therapy. In a female anginose case anaemia was severe and the white cells fell to 2,000, which led to a suspicion at first of agranulocytosis, especially as the abnormal cells of infectious mononucleosis have been described as occurring in agranulocytosis.

The mononucleosis varied from 45 to 60%—only in a few cases did it exceed 75%. The most striking change in the lymphocytic series of cells was the almost complete disappearance of small lymphocytes; this occurred early in the disease. The other feature was a marked increase in the numbers of large lymphocytes and the appearance of abnormal lymphocytes. Many of the large lymphocytes had a very pale cytoplasm with the typical pale nucleus of the normal large lymphocyte—in most respects they did correspond to the normal large lymphocyte except that the cytoplasm was paler than usual and often vacuolated. Many of them contained the normal reddish-purple granules in their cytoplasm. Some of the large lymphocytes appeared to be unduly fragile. Films made from early cases contained many smear cells.

The abnormal lymphocytes varied greatly in morphology—in size they ranged from a cell intermediate between a large and small lymphocyte to a large monocyte. The cytoplasm was usually much more basophilic than that of the ordinary lymphocyte and was nearly always vacuolated. Some of the abnormal cells were difficult to distinguish from plasma cells. The nuclei varied greatly in shape—some were oval or rounded, others irregular or lobulated. The nuclear chromatin was dense. Some of the abnormal lymphocytes had irregularities of their cytoplasm which resembled pseudopodia. Many of the abnormal lymphocytes seen corresponded to Downey's Type I and Type II; only in a few cases was Downey's Type III evident. Peroxidase staining failed to reveal any granules in the cytoplasm of the abnormal lymphocytes.

Blood changes usually persisted for several weeks, and a fair proportion of cases still had many abnormal cells present at the end of three months. A true monocytosis was not a notable feature; it occurred late and usually varied from 10 to 13%. An interesting phenomenon previously noted by Barrett was confirmed in this outbreak: the typical blood changes may be present before clinical manifestations make their appearance. This was noted in several cases.

In most of our cases the sedimentation rate was not affected: only in anginose cases and those with pyrexia did the B.S.R. increase. In one case with pyrexia, severe meningitic manifestations, and a C.S.F. cell count of 300 lymphocytes per c.mm. the B.S.R. never rose above 4 mm. per hour (Westergren).

Sternal puncture was performed on several cases. Examination of the marrow revealed a definite increase in lymphocytic cells and a slight increase in activity of the myeloid series of cells. In some marrow specimens there was an increase of cells of the plasma cell type, and cells resembling the abnormal lymphocyte in the peripheral blood were also noted. These findings correspond to those of Israëls (1941). It is proposed, however, to deal with the findings in a separate paper at a later date.

Pathology of Lymph Glands

Biopsy of lymph glands was performed on several cases, and reports of two, with case histories, are as follows:

Male aged 27.—Sept. 16, 1942: Sore throat and frontal headache; pain in back and axillae. Glands palpable in both axillae. During next 14 days nausea, headache, and pain in axillae and groins were present, and on Sept. 27 there was generalized glandular enlargement with slight splenomegaly. Blood examinations: Sept. 15: W.B.C. 10,600—polymorphs 70%, large lymphocytes 10%, small lymphocytes 2%, monocytes 5%, abnormal lymphocytes 13%. Sept. 23: W.B.C. 12,000—polymorphs 57%, large lymphocytes 11%, small lymphocytes 2%, eosinophils 2%, basophils 1%, monocytes 10%, abnormal lymphocytes 17%. Paul-Bunnell tests: Sept. 9, 1:64; Sept. 23, 1:128; Sept. 30, 1:128; Oct. 17, 1:32.

Report on Gland from Left Axilla.—Well-marked hyperplasia of the lymphoid tissue is present, many of the germinal centres being very large and prominent. A number of the sinusoids show moderate but distinct dilatation and are packed with numerous reticulo-endothelial mononuclear cells, together with a moderate number of small lymphocytes. Scattered areas of old fibrosis, presumably post-inflammatory, are also present.

Man aged 23.—Sickened Sept. 12, 1942, with severe frontal headache, shivering attacks, and pain in both groins. Eyes sore and watering. Glands palpable in both anterior and posterior triangles of neck and in both groins; later developed slight splenomegaly. A blood examination the same day showed: W.B.C. 18,450—polymorphs 69%, large lymphocytes 15%, small lymphocytes 2%, eosinophils 2%, basophils 1%, monocytes 1%, abnormal lymphocytes 10%. Paul-Bunnell tests: Sept. 10, 1:128; Sept. 22, 1:64; Oct. 11, 1:64.

Report on Gland from Right Groin.—Lymphoid hyperplasia is present, but is not a prominent feature. Sinusoidal dilatation is, however, much more conspicuous than in the preceding case. The dilated sinusoids contain numerous reticulo-endothelial mononuclear cells, together with a moderate number of small lymphocytes.

We are indebted to Dr. W. Forbes, Department of Pathology, Edinburgh University, for the report on these glands. The changes described in the glands correspond to previous descriptions. They cannot be regarded as specific.

Treatment

In our cases treatment was mainly symptomatic. In two anginose cases sulphapyridine was given, but no favourable

response was obtained; in fact, in one case the throat condition became worse, pyrexia continued, and blood transfusion had to be given. As the granulocytes are reduced in infectious mononucleosis and many show toxic changes, it is not surprising that sulphonamides do not give good results. Tidy (1941) states that if granulocytes are normal or increased in number no harm is done with sulphonamides. He has seen cases made worse by sulphonamides. Convalescent serum was not used. One case with fairly severe meningeal symptoms, pyrexia, and raised C.S.F. cell count made a rapid response to sulphadiazine.

Discussion

The unusual features in this epidemic were the high infectivity and the presence of latent cases. Before the epidemic started 5 known cases of infectious mononucleosis were admitted to the medical unit. This would increase the chances of spread considerably, but it hardly accounts for cases elsewhere in the hospital and outside. It seems likely that the district had an epidemic of mild infectious mononucleosis which was fairly localized. In view of the protean manifestations of the disease and the difficulty of diagnosis in the absence of haematological and serological tests the outside cases would be regarded as influenza, gastro-enteritis, etc. The difference in the findings between the outside controls near the hospital and those situated at some distance is very striking, and points to a definite localization of the disease. The spread of the epidemic within the hospital is difficult to follow. Efforts to trace case-to-case infection did not meet with any satisfactory result.

Latent cases can be explained on the basis that their immunity was sufficient to prevent the onset of clinical manifestations, as in the manner of diphtheria and meningococcus carriers. In infectious mononucleosis, however, the presence of the infecting virus produces changes in the blood picture and stimulates the production of heterophile antibodies so that latent cases are easily detected.

Differential Diagnosis

Epidemic infectious mononucleosis in adults is a relatively mild condition which simulates many other conditions. The anginose type resembles diphtheria, but here the blood picture is useful to distinguish these conditions: in diphtheria a polymorphonucleosis is invariable, while in a fully developed anginoid infectious mononucleosis absolute lymphocytosis is the rule. The cerebral type may closely simulate a true septic meningitis, but although the cell count may be raised to 300 or 400 per c.mm. the predominant cell is a small lymphocyte. This, of course, still leaves it doubtful whether or not it is a tuberculous meningitis; to exclude tuberculous meningitis the blood picture and Paul-Bunnell test are of undoubted value. In one of our cases with meningeal symptoms the C.S.F. cell count was 400 per c.mm. and optic neuritis was present for 8 weeks; the patient also had glandular enlargement, with the usual haematological and serological findings, and made a complete recovery. Cases with thoracic symptoms may simulate pleurisy or pneumonia, while those with severe vomiting and diarrhoea may closely resemble acute gastro-enteritis or typhoid fever.

The blood picture in infectious mononucleosis may be simulated to a certain extent in other conditions, particularly catarrhal jaundice and atypical pneumonia. In catarrhal jaundice abnormal lymphocytes are not infrequent, but here the Paul-Bunnell test and the absence of glandular enlargement help to differentiate the two conditions. In four cases of atypical pneumonia seen by us there was an absolute lymphocytosis, and abnormal lymphocytes were present; some of these had a deeply basophilic cytoplasm and were in many respects similar to the abnormal lymphocytes of infectious mononucleosis. However, in all four cases the Paul-Bunnell test was negative and glandular enlargement was absent. Downey and Stasney have commented on the presence of abnormal lymphocytes in agranulocytosis, a condition which may also simulate anginose infectious mononucleosis. In cases with a rash the diagnosis of secondary syphilis, rubella, or erythema nodosum may be considered. Rubella may be very difficult to differentiate from infectious mononucleosis: in both conditions the posterior triangle glands are enlarged, and the rash of rubella may be closely simulated in infectious mononucleosis. In rubella the peripheral blood contains many Türk cells and abnormal lymphocytes, rather resembling those of infectious mononucleosis. However, the Paul-Bunnell reaction is of undoubted value, as it is consistently negative in rubella. In three cases of rubella seen by us the Paul-Bunnell test was negative throughout the disease. The rash in infectious mononucleosis may often resemble that of typhoid; and here the diagnosis may be difficult, as false positive Widal tests have been reported in infectious mononucleosis by Bernstein. Again the Paul-Bunnell test is very useful. The more serious blood disorders, such as leukaemia, should never be confused with infectious mononucleosis, for, as Smeall pointed out in 1942, the changes in the red cells in leukaemia make the distinction quite clear. In general it may be said that the diagnosis of infectious mononucleosis should not be made on any one test: the Paul-Bunnell reaction, the haematological findings, and the clinical manifestations should all be correlated before coming to a decision.

It seems likely that infectious mononucleosis, especially in a mild form, is a very common condition which can readily be mistaken for other diseases. Since the hospital reopened we have seen a number of cases of infectious mononucleosis, many of which would have been regarded as some other condition unless blood counts and Paul-Bunnell tests had been carried out.

Summary

An epidemic of infectious mononucleosis is described.

The unusual features were: (*a*) a high percentage of infected cases in the adult population; (*b*) the occurrence of cases with haematological and serological findings and no clinical manifestations; (*c*) the fact that blood and serological changes may precede clinical manifestations.

Attention is drawn to the difficulties in diagnosis, and the necessity for repeated Paul-Bunnell tests before excluding the disease.

The condition is always benign and does not respond favourably to sulphonamide therapy.

We are much indebted to the following for their help and advice: Prof. L. S. P. Davidson, Dr. J. L. Halliday, Prof. T. J. Mackie, Dr. A. A. F. Peel, and Dr. I. S. Sutherland; and to Dr. J. A. Jenkins, medical superintendent, and our colleagues in the hospital for their co-operation and help. We are indebted also to the Department of Health for Scotland for permission to publish this paper.

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Dr. E. H. Cluver's report for the year 1942 as Director of the South African Institute for Medical Research, Johannesburg, includes a section on war work. There has been further expansion in various branches of the Institute's activities to meet increasing military needs. Vaccines and sera produced under normal conditions for civilian requirements were wholly inadequate in quantity to cope with the special hazards to which campaigning troops are exposed. Their production had to be enormously increased and new procedures had to be introduced; for example, anti-gas-gangrene serum, not prepared locally before the war, is now being produced on a very large scale. A military Directorship of Pathology, under Dr. Cluver as honorary colonel, was set up to undertake the training of staff for the various military hospital laboratories and to supervise their equipment and running.

A NEW APPROACH TO THE TREATMENT OF EARLY SYPHILIS BY INTENSIVE THERAPY

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Our purpose in writing this paper is to present a new understanding of "early syphilis" and of its treatment by a modified form of intensive therapy, with the result of work and investigations done on a series of 100 cases. Our aim has been to try to evolve a scheme of treatment which, while promising to be adequate and effective, may at the same time reduce the toxic effects of existing methods to a minimum.

It has been universally accepted that the earlier syphilis is diagnosed and treatment begun the greater the percentage of cure. But that syphilis can be aborted is proved by:

1. Magian's (1919) self-inoculation experiment with *Spirochaeta pallida*—namely, a single injection of arsphenamine given one hour after inoculation and no subsequent relapse.

2. Fournier and Guenot's (1919) experiments with 40 women treated with from four to six injections of arsphenamine, 20 of whom, followed up, remained free from syphilis for three years after having been infected up to three weeks previously by men with proved contagious genital lesions, while those who refused treatment under exactly similar conditions all subsequently developed syphilis.

3. Paul Padget's (1941) dictum that patients who received as little treatment as only from four to six injections of an arsphenamine by conventional divided-dose technique have a 60% chance of a five-year cure.

Accordingly we have tried to find out whether there is any reliable guide to the stage of infection that can be aborted by some such small-dosage method.

Moore *et al.* (1941a) state: "It is unfortunate that no method exists by which the probable cures after small amounts of treatment can be picked out before or during treatment, and that this hiatus in our knowledge is responsible for the undoubted fact that some patients receive much more treatment than is actually necessary." We believe that the selection of cases stressed by Moore can be achieved by performing a daily quantitative serum test for syphilis (D.Q.S.T.S.) as evaluated by a Kolmer-Wassermann or some other equally sensitive test. It is on the results of this D.Q.S.T.S. that we have evolved an original line of approach to a more exact method of diagnosis and treatment of early syphilis.

Diagnosis

The Q.S.T.S. performed daily on patients undergoing intensive treatment with the single daily injection has resulted in certain definite findings. These findings can be placed in three main categories.

Category I—the early primary—is that in which the serum of a patient during treatment remains at a constant negative level. There can be no syphilitic reagin present in the serum or it would give a positive or doubtful reading.

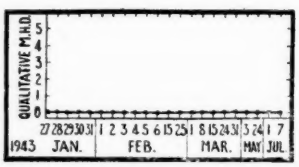
Category II—the middle primary—is subdivided into two types. Type A is that in which there is an initial negative phase persisting for anything up to five days after the institution of treatment, followed by a sharp rise to the positive zone. This, persisting for sometimes up to eight days and not reaching above a titre of 17, given by tube readings of 4, 4, 4, 4, 1—i.e., 25% inhibition of haemolysis in fifth tube, which contains 0.005 ml. of serum—reverts immediately to negative before the completion of treatment and, except perhaps in some cases for a slight secondary very transitory rise, remains negative subsequently. Type B is that in which the titre is already rising at the beginning of treatment, but its subsequent behaviour is exactly similar to Type A. This Category II appears to be one which has so far escaped notice, as it must inevitably do when blood tests are taken at weekly or longer intervals.

The table on p. 450 shows that this "middle positive phase" has occurred in 19 of our cases, and a possible explanation should be attempted. We feel that this positive phase: (1) Is not a technical error within the limits of the test (cf. "Laboratory Routine," para. 8), (2) Is not connected with a Herxheimer reaction. Only one of the middle primary cases has had a Herxheimer reaction, and his positive phase did not take place until the fifth day of treatment. (3) Is not due to any provocative drug action, as, if it was, it would show very much more frequently and at the expense of the early primary group. A provocative effect after an injection of arsenic is now disputed, and is considered to be fallacious (Moore *et al.*, 1941b).

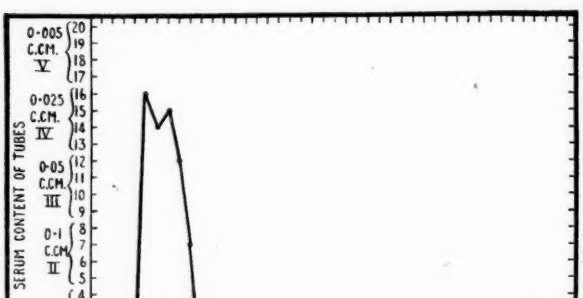
An explanation is that it may well be an "abortive phenomenon"—the early injections not being sufficient to prevent completely the potentially rising titre, but with succeeding doses the positive phase is overcome. But for treatment, such a serum would presumably continue to rise to the high titre of the late primary. It is more than a coincidence that this phenomenon has appeared in one out of every five cases. It is a group which to us seems to be of great importance, as it is a link between the early primary and the late primary groups; unless recognized and treated appropriately it may well be a potential source of relapse.

Category III—the late primary—also occurs in two types. Type A is that in which the serum has already reached a high titre before treatment. This type remains at a consistently high level, which may be maintained for an indefinite period but which eventually reverts to negative. This may take place just before the end of treatment or later, within a period of six months. This fact is important, as, provided a patient with late primary has received his estimated dosage of arsenic, the positive serum should merely be controlled and not considered as an indication for further anti-specific treatment in the absence of negative clinical signs and within this time period. In Type B the titre rise takes place just after the initial injections and remains consistently at a high level for a period of approximately three weeks before reverting to normal, thus differing from the middle primary Type A, which shows only a very transitory positive phase before falling again to negative. In our series of Type A cases the serum has reverted to negative in a much shorter time than six months, probably because patients report for treatment earlier than is the case in civilian practice.

For clarity in demonstrating these three categories a graph is drawn for each patient, using the date line as the ordinate and the quantitative titre reading as the co-ordinate. This forms a simple guide to the visualization of the separate group-readings.



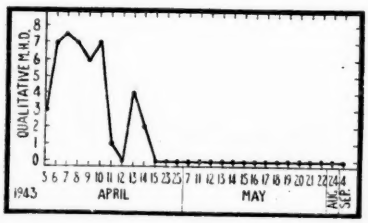
GRAPH I.—Early primary (Category I). Incubation, 6 weeks; *Sp. pallida*, none found at 20 hours; total mapharside dose, 580 mg.; days under treatment, 10.



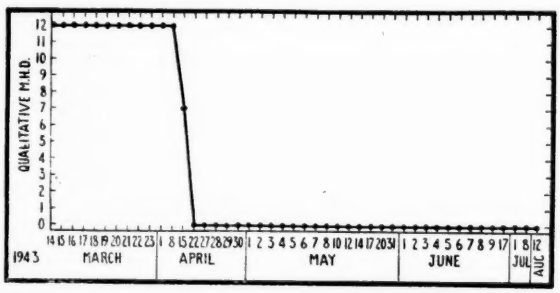
GRAPH II.—Middle primary, Type A (Category II, Type A). Incubation, 6 weeks; *Sp. pallida*, none found at 30 hours; total mapharside dose, 970 mg.; days under treatment, 20.

Our series further demonstrates that there is no definite constant relation between the incubation period of the first clinical sign—the sore—and the appropriate category. Thus, in 35 early primary cases the average number of days' incubation of the sore was 27.5, varying from 8 to 63; of 16 middle primary cases 34.9 days, varying from 5 to 84; and of 31 late

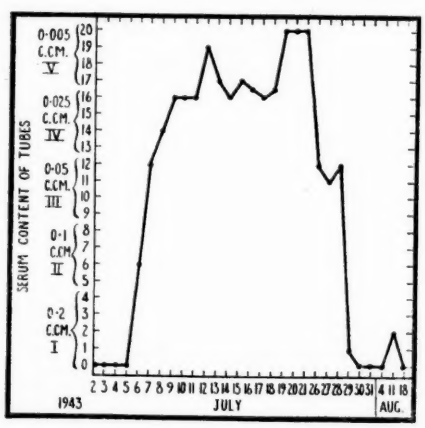
primary cases 61.2 days, varying from 21 to 112. No incubation period could be determined with certainty in a few of the series because of marital relation, frequent exposures, "loss of memory," etc. It seems that there must be some human factor of resistance present for the incubation of the primary lesion. Another point of interest is that during positive phases there does occur, in many cases, a daily variation in the amount of reagin present in the patient's serum.



GRAPH III.—Middle primary, Type B (Category II, Type B). Incubation: (1) 10 days, (2) 4 weeks; *Sp. pallida*, none found at 16 hours; total mapharside dose, 940 mg.; days under treatment, 20.



GRAPH IV.—Late primary, Type A (Category III, Type A). Incubation, 6 weeks; *Sp. pallida*, none found at 16 hours; total mapharside dose, 1,430 mg.; days under treatment, 30.



GRAPH V.—Late primary, Type B (Category III, Type B). Incubation, ? 1 month; *Sp. pallida*, none found at 18 hours; total mapharside dose, 1,300 mg.; days under treatment, 30.

Treatment

Moore *et al.* (1941c), Chargin (1940), Shaffar (1943), and others have pointed to the increased toxicity of neoarsphenamine as compared with arsenoxide for use in intensive therapy, and so mapharside was decided on as the most suitable preparation for our purpose. In fact, in the Royal Navy mapharside is now the drug of choice, and is replacing neoarsphenamine for routine use.

It is usual in courses of intensive treatment to give a dosage of 1,200 to 1,800 mg. of arsenoxide for all types of cases of primary, secondary, and early latent syphilis indiscriminately —that is, there is a fixed predetermined dosage for all types of cases. "Early sero-negative" responsive cases have to risk the large drug dose necessary for the resistant case—a dose, perchance, associated with all too high mortality and toxic rates.

We believe this predetermined fixed dosage for all types of cases to be illogical. Dosage should be regulated according to the categorized type. Before this investigation was started no control of minimum dosage had been tried on a series of early syphilis differentiated into definite types, but it is only rational to think that an early primary case with a consistently negative blood Kolmer-Wassermann reaction should require a smaller dose than a middle primary case having a positive blood phase—likewise, a middle primary should require less than a late primary having a consistently high serum titre; all presumably representing different degrees of intensity of infection. On this deduction we have based our scale of dosage.

The early primary cases are regarded as a group which can be aborted and so require a small abortive dosage. The middle primary requires a slightly higher dose that is still considered an abortive dose; while the late primary—the well-established group—requires a curative dosage. We began by giving the early primary case a total of 600 mg. in 10 daily injections; but this has now been revised to 15 daily injections of 0.04 g. to 0.06 g.—a total of 600 to 900 mg., depending on the patient's weight. This alteration was made for two reasons: first, because we felt that a small daily dose given over a slightly longer period would lessen the likelihood of toxic effects; secondly, because we had three relapses. However, in fairness to ourselves it should be mentioned that at the beginning of our investigations a less sensitive Wassermann technique than the Kolmer-Wassermann was in use, so these three relapses may well have been missed middle primary cases, but treated with the early primary dosage; this would account for the relapses. The important point is that no relapse has occurred since the introduction of the Kolmer-Wassermann quantitative test. This may, however, be pure chance, as the numbers so far treated have been small.

Not having any previous guide to an abortive dose apart from Padget's (1940) conclusions, the above dosage was decided upon somewhat empirically, and is subject to revision as experience and results justify. For the middle primary a slightly increased dosage was considered necessary because of the positive phase; accordingly 20 daily injections of 0.04 to 0.06 g. —totalling 800 to 1,200 mg.—were given, depending again on body weight. Originally these injections were given as two series of ten with a rest period; this has now been altered to consecutive doses.

For the late primary a still further increase was necessary, and so 30 daily injections of 0.04 to 0.06 g.—totalling 1,200 to 1,800 mg.—were given; this approximates the standard accepted curative dosage for conventional intensive therapy—i.e., 20 to 30 mg. per kg. of body weight (Eagle and Hogan, 1943). At first these were also given in divided courses of ten with rest periods; this has now been modified to consecutive doses.

It is a dictum that the longer an estimated arsenical dosage can be spread the less are the toxic effects, so the single daily injection was decided on in preference to the multiple daily injection intensive method, so as to spread the dosage. An early cure with the least possible toxic reaction and minimum dosage is constantly in mind. Again we would like to repeat that these dosages are subject to future modification, depending on follow-up results and toxic effects, but they form a basis for trial relative to the described categories. All patients have been treated as hospital in-patients. Bismuth has not been given.

Reactions

The only serious reaction that has occurred so far has been one case of agranulocytosis.

This developed after a dosage of 1,130 mg. in one of the late primary cases. It was diagnosed within 24 hours of the first symptom—pain in the gums—and treatment with pentnucleotide was started immediately. In three days the blood picture had improved, and after 110 c.cm. of pentnucleotide recovery was complete. Blood counts done since the patient left hospital have shown that improvement has been maintained. Moore states that this condition is very rare, only 78 cases having been reported up to 1941 in all patients undergoing any form of arsenical treatment for syphilis.

The jaundice figures (11 cases in all) are low compared with the high percentage of cases occurring with the routine neoarsphenamine schedules; only 4 of the cases were discharged to hospital. Jaundice seems to occur as two separate types. One type, of which we had 3 cases, developed between the

eleventh and fourteenth days after starting treatment; it was mild in degree and did not necessarily interfere with the sequence of treatment. The other type (8 cases) developed from the ninth to the twelfth week after the initial injection, when intensive therapy had long been finished. This type was more severe, jaundice occurring about the twelfth week in the routine neoarsphenamine schedules.

In any treatment extending beyond the 10-day period toxicoderma may be expected; but this is not usually a contra-indication to subsequent arsenic, although a rest of one month is advisable before further treatment, starting with a very small dose and gradually increasing, bismuth being given meanwhile.

Other toxic manifestations, such as arsenical dermatitis, peripheral neuritis, and toxic encephalopathy, have not occurred. The only headaches were those following lumbar puncture, which is performed on every case before leaving hospital.

Relapses

There were three cases of clinical relapse in our series.

The first was in an early primary case whose relapse was discovered 55 days after completion of treatment. It has already been pointed out that this may have been a misdiagnosis, due to a non-sensitive Q.S.T.S. technique. The second sore occurred on the site of the original chancre, and was preceded by a rise in the Q.S.T.S. from the negative zone. There was no history of re-exposure.

The second case was in a middle primary, and again suggested inadequate initial treatment following on a misdiagnosis, as it may well have been a late primary initially. At relapse the serum was negative, and it was only after a further 10 injections, totalling 560 mg., that the serum was shown to be positive by the introduction of the Kolmer-Wassermann quantitative technique. During two months after his last course of treatment this patient has remained consistently negative, clinically and serologically.

The third case was originally diagnosed as an "early primary," again not on the Kolmer-Wassermann quantitative technique. His serum remained consistently negative for one month before the clinical relapse took place, but became positive during subsequent treatment. His second sore was on the site of his original chancre. This case has been classified as a relapse owing to the second sore being on the site of the original chancre, in spite of the possibilities of reinfection due to the known social and alcoholic habits of the patient.

Reinfections

Since the introduction of intensive therapy, Moore, Shaffar (1943), Schoch and Alexander (1943), and others have laid down new and simpler postulates of reinfection. Judged by these standards we have had three cases of reinfection. The first was in an early primary treated case with a definite history of re-exposure. At the time of reinfection the blood serum was negative. The fresh sore was not on the original site. He was re-treated, and has so far remained negative for over three months. As his consort was an unknown "lady of easy virtue," it was not possible to trace her. The second was in a late primary treated case, marital relations being resumed on the patient's discharge from hospital with sore completely healed and Kolmer-Wassermann negative. He reported 52 days later with a fresh sore, not on the original site. *Sp. pallida* was demonstrated and the Kolmer-Wassermann was negative. Treatment was restarted and his fresh infection was categorized as middle primary. As a matter of added interest, from April 7 to Aug. 12, 1943, this patient received a total of 2,380 mg. of arsenoxide with no ill effects at all. His wife, examined by us, was found to be suffering from active secondary syphilis with a strongly positive Kolmer-Wassermann reaction, and *Sp. pallida* was present in two open lesions of the labia. She had been infected originally by her husband, and had never been examined in spite of requests by us.

The third case was a treated early primary discharged from hospital with a healed sore and a negative blood reaction. He resumed marital relations immediately on discharge from hospital, and reported two months later with multiple sores on the penis—not one, however, on the site of the original chancre. His wife had only started initial treatment with bismuth and intramuscular arsenic the day before her husband returned to her. Subsequently examined by us, she had marked ulceration of her cervix, pronounced generalized adenopathy, and a history of rash and sore throat. Owing to treatment which she had subsequently received before we saw her *Sp. pallida* could not be demonstrated. We feel satisfied that these are three clear cases of reinfection.

Laboratory Routine

In all cases the following laboratory routine is carried out:

1. Daily urine Ehrlich and albumin tests.
2. Icterus index at beginning and end of treatment, and during treatment if necessary.
3. Complete blood counts at the start of treatment.
4. B.S.R. estimation.
5. C.S.F. examination.
6. Every case diagnosed on the finding of *Sp. pallida*, except three cases of early latent syphilis.
7. *Sp. pallida* controlled until "none found."
8. Daily Kolmer-Wassermann Q.S.T.S. done in batches twice weekly in accordance with Kolmer's published technique (Kolmer and Boerner, 1941). These tests are done in a laboratory where from 400 to 500 sera are tested weekly by both the Kolmer-Wassermann and the Kahn standard. Originally hundreds of control sera were tested with a standard British Wassermann technique in addition. The tests are therefore adequately controlled, and hundreds of repeated tests have shown that, although minor variations in sensitivity occur from test to test, the graphs obtained represent—within the limits of the test—the level of syphilitic reagin in the blood.

Table showing an Analysis of Cases

	Type of Case		
	Early	Middle	Late
No. of cases	40	19	41
Average incubation period (days)	27·5	34·9	61·2
Shortest incubation period (days)	8	5	21
Longest incubation period (days)	63	84	112
Average No. days for sore to heal	7·7	7·7	12·2
Primary fever over 99°	5	7	6
Secondary fever over 99°	12	7	15
Toxicoderma	2	—	2
Jaundice	4	4	3
Agranulocytosis	—	—	1
Relapse	2	1	—
Reinfection	2	—	1
Other toxic manifestations	—	—	—

After an average of 20 hours *Sp. pallida* was not found.

It will be noticed that with 0.04, 0.05, or 0.06 g. of mapharside *Sp. pallida* disappeared from the surface lesions in an average of less than 24 hours, thus proving that mapharside removes that organism from surface lesions in a time comparable with 0.45 to 0.6 g. of neoarsphenamine.

Summary and Conclusions

An attempt has been made to present a new conception of "early syphilis" based on the results of the quantitative Kolmer-Wassermann test performed daily on a series of 100 patients undergoing intensive therapy. By this means early syphilis has been recategorized into three distinct groups or types—"early," "middle," and "late" primary syphilis.

We look on this recategorization as giving a new and original line of approach to the treatment of early syphilis by intensive therapy. It provides a fair and reliable index of the intensity of the individual patient's infection, thus allowing him the opportunity of a true scheme of treatment—abortive for the early primary and middle primary, and curative for the late primary. The duration of treatment would be 15, 20, or 30 days respectively, with dosages of 600 to 900 mg., 900 to 1,200 mg., and 1,200 to 1,800 mg., depending on body weight. That all these groups should be treated by the same fixed predetermined dosage we feel to be unscientific. The "dosage-spread" with the longer time-factor should surely lower the toxic effects as recorded by results of the intensive therapy standard doses now in general use, and it should be a great step in removing the menace of encephalopathy, which is always looming in this work. By means of intensive therapy the problem of continuity of routine treatment schedules in the Services owing to the exigencies of war would be overcome, as interrupted schedules, with the resulting drop in percentage of cures, are greatly to the detriment of patient and Service alike.

A warning is not out of place here that intensive therapy should be carried out only in recognized treatment centres: the risk attendant on indiscriminate treatment by inexperienced people is great. These treatment centres should have the services of pathologists who are familiar with the Kolmer-Wassermann Q.S.T.S., or some other equally reliable sensitive quantitative technique, as it is on the pathologist's results that reliance must be placed for accurate diagnosis.

It is realized only too well that at this stage it is far too early to offer anything more than a suggested scheme of diagnosis and treatment, but we hope—and feel—that further investigation on a large number of patients will substantiate our expressed views. In these times men are drafted to all parts of the world, where perhaps facilities are lacking for blood controls and proper surveillance, but

time alone will show whether we are correct in our assumptions. We can only be encouraged by our results of the past eight months. No little purpose will have been served if we have sown the seed for a new line of thought and research on the diagnosis and intensive treatment of early syphilis.

We wish to express our thanks to the Medical Director-General of the Navy, Sir Sheldon Dudley, for permission to carry out this work and for his support. Thanks are also due to Surg. Lieut.-Cmdr. Sloan Miller for all his laboratory co-operation, and to the sick-berth staff for their never-failing help.

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ASSESSMENT OF LEVEL OF NUTRITION

REVISED PROCEDURE FOR ESTIMATION OF ANEURIN IN URINE BY THE THIOCHROME TEST

BY

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AND

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The nutritional status of human subjects in vitamin B_1 can be assessed by examination of the urine before and after test dosing, the procedure being in principle analogous to that introduced previously for determining the level of vitamin C (Harris, Ray, and Ward, 1933; Harris and Ray, 1935) and later for nicotinic acid (Harris and Raymond, 1939). In its original form (Harris and Leong, 1936; Harris, Leong, and Ungley, 1938) the test for vitamin B_1 involved a biological assay of the urine, preferably by the bradycardia method (Birch and Harris, 1934). This has been used by various investigators—e.g., Wright and Baker (1939), Guha and Ahmad (1939). Later the perfecting of the chemical method of estimating vitamin B_1 by the thiochrome reaction (Jansen, 1936) has made possible a great simplification in the routine. In previous papers (Wang and Harris, 1939; Harris and Wang, 1941) we described a suitable technique for the estimation of the aneurin in the specimens of urine by a modified thiochrome test. This has been used satisfactorily by workers in other laboratories (e.g., Slater, 1941; Toverud, 1940). We checked its reliability, by comparison with biological assays, using the bradycardia technique, in several series of comparisons; and the agreement was found to be satisfactory (Wang and Harris, 1939; Harris and Wang, 1941).

Given a little experience, the method is found to work smoothly with nearly all specimens of urine; in rare instances, however, samples may be encountered that give an abnormally whitish-green blank and a dark-blue fluorescence on oxidation, which may make it tiresome to effect a satisfactory matching. To overcome this objection we tried treatment of the urine with H_2O_2, a reagent which had been previously employed by McFarlane and Chapman (1941) in estimating aneurin in green feeding-stuffs. This addition of H_2O_2 reduces the blank considerably and renders the final matching very easy even in the most troublesome specimens of urine (Wang and Harris, 1942). The treatment of the urine with the H_2O_2 does not cause any destruction of thiochrome and presents a distinct advantage, and we now use it in all our routine estimations of aneurin. The method is so simple and rapid to carry out that it may be employed conveniently in regular clinical tests. For this reason it seems worth while to put together here the working instructions for the modified procedure, incorporating the foregoing and several other small improvements (Wang and Harris, 1942).

Method

1. *Preliminary Washing with Isobutanol.*—Measure 5 ml. of urine into a 15-ml. centrifuge tube, add a drop of concentrated HCl, and shake for one minute with an equal volume of H_2O-saturated isobutanol (redistilled). Centrifuge, discard the isobutanol (top) layer, and note the volume of the aqueous layer.

2. *Oxidation of Aneurin and Extraction of Thiochrome.*—Pipette two 1-ml. aliquots of the washed urine into two 25-ml. glass-stoppered cylinders marked A ("unknown") and B ("blank"). Into a third cylinder, marked C ("control"), introduce 1 ml. of a standard solution of aneurin containing 4 μg. per ml. (For urines collected after test dosing, it may be necessary to use a stronger standard—say, 10 μg. instead of 4 μg. On the other hand, with relatively deficient urines, containing little vitamin B_1, 2 ml. of urine may be taken for analysis instead of 1 ml. and added to cylinders A and B; in this case another 1 ml. of water should be added to the control (cylinder C) to equalize the conditions.) A stock solution containing 20 μg. of aneurin per ml. in 25% alcoholic N/100 HCl is kept for use in a cold place; the diluted standard should be freshly prepared from this. Add to each cylinder 2 ml. of methanol and mix well. To cylinder A add 1 ml. of 20% NaOH, mix quickly, and follow immediately by a 10% solution of $K_3Fe(CN)_6$, drop by drop, mixing thoroughly after each addition, until the colour of the $K_3Fe(CN)_6$ stays for more than 30 seconds. (Usually 2 to 3 drops are sufficient; large excess should be avoided.) Treat cylinder C in exactly the same way. To cylinder B, the "blank," add 1 ml. of 20% NaOH, but *no* $K_3Fe(CN)_6$. Now add 3 drops of 30% H_2O_2 to all three cylinders (if the urine gives an exceptionally high blank more H_2O_2 can be used). Mix well and allow to stand for half a minute. Then add 1 ml. of H_2O to each, followed by 10 ml. of redistilled isobutanol (if H_2O-saturated isobutanol is used the addition of H_2O may be omitted) and shake for 1 minute. Allow the layers to separate, then draw off and discard the bottom aqueous layer. Add 3 ml. of H_2O to each, shake gently for half a minute and again let the layers separate. Pipette off the top layer of isobutanol into three separate dry conical flasks and clarify with 2 ml. of 96% ethanol.

3. *Comparison of Fluorescence.*—Measure 10 ml. of the clear isobutanol extracts of the oxidized unknown A and the "blank" B into separate test-tubes. (These tubes must be of "non-fluorescent" glass, and uniform in diameter. A convenient size is one in which 10 ml. occupies a column of 6 to 7 cm. The bottoms of the tubes should be of the same shape.) Compare the fluorescence in the tubes, holding them in front of a source of ultra-violet light. The u.v. lamp should be enclosed in a case fitted with a Wood's-glass window, and the room in which the comparison takes place should be completely darkened. Incline the tubes at an angle of about 60 degrees to the horizontal and look down the tubes. The bottom of the tubes should rest on a black platform fitted to the Wood's-glass window. Never look for more than a few seconds, since prolonged exposure to the blue colour will temporarily desensitize the eye; but make a quick inspection and decide which tube has the stronger blue fluorescence. Reverse the position of the tubes and look again. By means of a micro-pipette add the standard of thiochrome (from cylinder C) to the "blank" little by little, mixing well after each addition by closing the tube with the thumb and inverting two or three times, until the fluorescence in both tubes is equal. (The thumb should be thoroughly cleaned with soap and water, as traces of grease may introduce considerable fluorescence.) Before the final matching add to the "unknown" an amount of isobutanol equal in volume to that of the standard added to the "blank." For further details concerning matching, including use of colour filters, see Harris and Wang (1941).

4. *Calculation.*—If U is the volume of urine taken for analysis (1 ml. or 2 ml.), v the volume of the standard used for the matching, x the total amount of aneurin (4 μg. or

10 μg.) in the standard solution, and r_1 and r_2 the volume in ml. of the extract before and after the preliminary washing with isobutanol, then the aneurin content of the urine is

$$\frac{xv}{10} \times \frac{r_2}{r_1} \times \frac{1}{U} \ \mu\text{g. per ml.}$$

$$\left(=\frac{4v}{10} \times \frac{r_2}{r_1}\text{, when, as in usual circumstances, } x=4 \text{ and } U=1\right).$$

5. *Interpretation of Results.*—Past work has shown that a normal adult male* subject receiving not less than the reputed requirement of vitamin B_1 (300 I.U. = 900 μg. of aneurin daily) excretes at least 90 μg. of aneurin daily (Wang and Harris, 1939). The excretion rises with each increase in the intake, rapidly adjusting itself to such changes. On a diet deficient in the vitamin the excretion quickly falls to a steady value of about 60 to 90 μg., where it is maintained for some time (Wang and Yudkin, 1940).

On the basis of observations such as the foregoing, nutritional status may be assessed by measurement of the "resting level of excretion" plus the response to daily test doses. A "resting" excretion of below 90 μg. combined with one or more days' delay before attainment of the plateau of excretion after the daily standard test doses (350 I.U.) can be assumed to indicate an insufficient intake. For further discussion of standards for excretion tests earlier papers from this laboratory may be consulted (e.g., Wang and Harris, 1939; Wang and Yudkin, 1940).

It is perhaps worthy of note that the differentiation between normal and deficient subjects by means of their urinary response is less steeply graded for vitamin B_1 than, for example, for vitamin C, and this means that saturation tests are somewhat easier for the latter than for the former. Thus, special emphasis has to be laid on the fact that the excretion of aneurin is relatively "labile," adjusting itself fairly rapidly to each change in the intake, as mentioned above. As a result, the "resting level" of excretion may sometimes do little more than reflect the intake during the few days immediately preceding the collection of the urine. With test doses the deficient subject satisfactorily answers to the test by giving less response than the normal subject on at least the first day, or first and second days, of test dosing; yet after a further day or so both deficient and normal will have reached an equal degree of excretion. (With extreme deficiency of long standing the response to test doses may be delayed a little further.) But for vitamin C, in contrast, the deficient subject may give little or no response at all to test doses for a period of some days, and full saturation will not be finally reached (in developed scurvy) until 7 to 10 days: thus the difference between normal and deficient is made more dramatically apparent than for vitamin B_1.

6. *Collection of Urine.*—If the urine is not to be tested within an hour or two of its being passed it can be preserved by the addition of a few ml. of glacial acetic acid (or HCl) and toluene.

7. *Avoidance of Certain Drugs.*—It is important that the patient should not take aspirin, quinine, or related drugs for some hours before or during the time of the test, since these may cause the excretion of highly fluorescent substances in the urine and so make an accurate determination of thiochrome impossible.

Summary

Working directions are given for the method of estimating vitamin B_1 in urine in the test for nutritional status, various improvements in technique being incorporated.

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* The minimal level of excretion by females may possibly be slightly lower (cf. Toverud, 1940; Robinson *et al.*, 1940). Precise figures for children, and the more detailed standards for varying intermediate degrees of deficiency, such as have now been worked out for vitamin C (Harris, 1943), still remain to be filled in.

LOCAL ORAL MEDICATION WITH SULPHANILAMIDE IN LOZENGE FORM*

BY

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The local application of sulphonamides has been the subject of much interest lately, and this method of treating oral lesions is attracting attention, though a report on the use of sulphanilamide following dental extractions was noted several years back in the *Journal of the Canadian Dental Association*. That the oral cavity may be a valuable site for absorption of drugs and particularly in the case of oral lesions, should not cause much surprise. The rich vascular bed of the buccal mucosa is readily available, as witness the immediate relief of substernal pain in angina pectoris after the use of a tablet of nitroglycerin sublingually. Intranasal application of drugs also has its advocates. Cattell (1943) points out "that no outstanding new discoveries in the field of sulphonamide therapy have occurred during the past year, but that, on the other hand, the period has been one of continual progress in the application of the sulphonamides."

It was a search for a suitable means of local oral application and absorption of the drug that prompted me, with the advent of sulphanilamide in 1937, to use it in a vehicle that would permit its slow release in the oral cavity and by direct contact promote local healing and defence against such organisms as are inhibited or destroyed by it. Then, as now, the mode of action of the drug cannot be regarded as fully settled, but justification for its application need not await complete elucidation of a *modus operandi*. The present report is based on the results of the direct application of sulphanilamide in a lozenge specifically for the purpose of testing its efficacy in cases of acute follicular tonsillitis, the aetiological agent being *Str. haemolyticus*, common at Fort Francis E. Warren, and the subject of much concern to all.

The manner of sulphanilamide administration as practised to-day calls for large doses of the drug—some 7 to 9 g. daily—for therapeutic effect upon a small area on the tonsils or adjacent pharyngeal wall. Other tissues resent playing host to the drug by producing an added lesion at times more deadly than the original condition. Stated in other words, an attempt was made to reverse the order of mass saturation preceding local therapeutics by a maximal local effect with a minimal blood concentration of the drug.

The vehicles used at the time were chicle (chewing gum) and lozenge. The lozenge proved the more satisfactory means. It could be held in the mouth for a period up to 45 minutes, was palatable, and liberation of the drug was slow and uniform. Several lozenges could be used daily, and no disturbing chewing manipulations were required. It was satisfactory both for children and for adults. A lozenge weighing 2 g. and containing 0.065 g. of sulphanilamide proved best suited for the treatment. Observations made at the time on mucosal staining, using prontylin and methylene blue in chicle and chocolate, agree with those of Arnett (1943).

The present study is a resumption of the above, though on a much larger scale and under better-controlled conditions. It is intended as a preliminary report, for it would have been more satisfactory had the work been carried through the entire winter season. The incidence of upper respiratory infection is as high during March as in any of the preceding months, and it is felt that enough clinical data have been obtained to warrant further investigation at a future date.

The increase in upper respiratory infections is an accompaniment of the expanding army. For the time being, fortunately, the diseases are mild, though at times of epidemic proportions. Nevertheless, they incapacitate fairly large numbers of new arrivals during their basic training period. This is inevitable owing to the close contact of the men, hence the rapid passage of infection from one individual to another. The problem

* This study was made possible through the assistance and co-operation of Col. D. W. McEnery, post surgeon, Fort Francis E. Warren, Wyoming.

is keenly recognized as an acute one, and attempts at control were in formation (*Army Medical Bulletin*, 1942) even preceding mobilization.

Therapeutics

Patients sent to the main hospital received lozenges, those to the Station Hospital Annexe had routine therapy consisting of aspirin, codeine, fluids, and gargles. Ward records of both institutions were compared. At the main hospital, for purposes of this study, any non-follicular red throat was regarded as influenza. It is impossible consistently to separate influenza from non-follicular tonsillitis. Acute tonsillitis, as defined by Cecil (1941), "is an acute inflammation of the palatine or faucial tonsils, but in nearly all cases the other lymphatic tissues in this region are involved. The tonsils are increased in size and hyperaemic. Many cheesy spots project from the crypts. A false membranous exudate may be present in other cases and a similar picture present in adjacent lymphoid tissue." This is the type of tonsillitis that is so common in this region. Throat culture of 24 cases on admission showed 22 to be positive for *Str. haemolyticus*.

Each patient was given eight lozenges to take—one each hour between 8 and 11 a.m., one at 4 p.m., two after the evening meal, and the last just before bedtime. The last dose is considered important, as the residual sulphanilamide during sleep is less subject to removal than at any other time. Fluids and food were forbidden between meals, as they would wash out the sulphanilamide present in the saliva and adherent to the tonsils and pharyngeal mucosa. The patient was encouraged to take fluids at meal-times. When the morning temperature reached normal, even though the previous evening temperature was 99°, and if the patient felt well, he was sent to quarters with a two-day supply of lozenges—six daily—and was given light duty for two days. The reason for the early discharge was based on the theory that if the drug was effective in the hospital it would respond in the same manner in quarters. Fluids were restricted, and further exposures, as entailed in getting out of bed for gargles or fluids several times a day, were avoided. Blood sulphanilamide estimations on several cases recorded infinitesimal quantities.

Eighty-six cases of tonsillitis thus treated spent on an average 2.6 days in hospital; 69 treated influenza cases averaged 2.4 days in hospital. Ten cases receiving a full systemic dosage of sulphonamides during this period were not considered in formulating the statistics. Only 7% of admissions received the drug in full doses. At the Station Hospital Annexe during the month of March 41 tonsillitis cases averaged 5.1 days in hospital. The average in 71 influenza cases was 5.7 days.

TABLE I

Days	Hospital						Annexe			
	Tonsillitis (March)		Influenza (March)		Tonsillitis (February)		Tonsillitis		Influenza	
	Cases	H.D.*	Cases	H.D.	Cases	H.D.	Cases	H.D.	Cases	H.D.
1	13	13	18	18	0	0	0	0	0	0
2	25	50	25	50	0	0	0	0	2	4
3	38	114	15	45	16	48	4	12	3	9
4	8	32	6	24	19	76	7	28	7	28
5			4	20	27	135	15	75	23	115
6			1	6	24	144	10	60	18	108
7	1	7			5	35	3	21	10	70
8	1	8			6	48	2	16	3	24
9					Routine		Routine		2	18
10	Lozenges		Lozenges		3	30			2	20
11					1	11			1	11
Totals	86	224	69	163	101	527	41	212	71	407
	Aver. hosp. days, 2·6		Aver. hosp. days, 2·4		Aver. hosp. days, 5·2		Aver. hosp. days, 5·1		Aver. hosp. days, 5·7	

* H.D. = Hospital days.

Many cases at the Station Hospital Annexe had a normal temperature for one and two days before discharge. No criticism of such routine therapy is intended. However, the comparison revealed itself as the work proceeded. If it is possible to reduce the average stay in hospital to 2.6 days by local oral therapy a considerable saving of beds is made. The results obtained at the three dispensaries are in accord with those at the hospital. The opinions of the dispensary medical officers are uniform, and may be summarized as follows:

1. 50% of the usual hospital cases are now referred direct to quarters.
2. There is a fall of temperature to near normal in 24 to 48 hours.
3. Many cases that show the spotted throat and a normal temperature are aborted by use of the lozenge—i.e., no subsequent rise of temperature occurs.
4. There is rapid alleviation of pain and soreness of throat.
5. The dispensary medical officers feel that the lozenge therapy avoids the frequent necessity for walking to and from wash-rooms that gargles and fluids entail at the barracks, and that these interruptions of bed-rest are done away with entirely.

One immediate effect noticed at hospital and dispensary was the relief of throat pain, which may occur within two hours. This relief was so striking that lozenges containing 3 gr. were supplied to the dental clinics for use in cases of multiple extraction and badly healing wounds. Thus far, not enough material has been gathered to express an opinion with regard to their usefulness for the last-mentioned purpose.

As shown in Table I, 44% of tonsillitis patients and 62% of influenza patients were discharged with normal temperatures within 48 hours. At the Station Hospital Annexe only 2% of all patients were discharged during the same period; in terms of hospital days, 131 to 4—a saving of 127 hospital days. No tonsillitis patients in February were discharged within 48 hours. Only 7% of the total hospital patients for March received sulphanilamide in the usual massive systemic dosage, against 30% at the annexe. It is understood that patients admitted to the hospital were at least moderately ill, with temperature as a rule above 100°.

Prophylaxis

The companies used for prophylactic treatment were composed of new men beginning their basic training. Lozenges were taken at 9 a.m., 10.30 a.m., 1.30 p.m., and at bedtime. Fluids were restricted. In order to avoid carrying over cases in process of development the first three days of administration were not included in the statistics. The lozenges were continued for another fourteen days, each company being examined every morning, with the following results:

Co. K, 240 men, examined by Lieut. J. A. Moore; 100 receiving lozenges developed one case of tonsillitis, or 1% incidence; 140 controls showed 14 cases, or 10%.

Co. F, 167 men, all receiving lozenges, showed 3 cases, or 1.8%.

Co. D, 110 men, 55 receiving lozenges, showed 2 cases, or 3.6%; 55 controls showed 10 cases, or 18%.

Co. G, 257 men, all controls, produced 21 cases, or 8%.

Of 24 throat cultures in Co. F, six were positive for *Str. haemolyticus*, while of 24 throat cultures in Co. G 9 were positive for *Str. haemolyticus*. Blood determinations of the drug on all specimens analysed were recorded as too low for reading.

TABLE II.—*Results of Prophylaxis*

		Tonsillitis		Influenza	
		Cases	%	Cases	%
Co. K ..	Treated, 100	1	1	14	14
	Controls, 140	14	10	28	20
Co. F ..	Treated, 167	3	1·8	13	7·7
Co. D ..	Treated, 55	2	3·6	8	14
	Controls, 55	10	18	10	18
Co. G ..	Controls, 257	21	8	27	10

Owing to a temporary failure in production the supply of lozenges was reduced in the case of Co. F for two days of the experimental period, and none was administered to all companies on the tenth day of the fourteen-day period.

Discussion

Many pertinent questions can be raised regarding this mode of therapy. The saliva drug content was not estimated, as it would not prove the case one way or the other. Arnett (1943) reports that the salivary sulphadiazine level ranged from 33 to 96 mg. per 100 c.cm. of saliva from chewing 0.3 g. of that drug in paraffin for a period of two hours. As noted previously, blood sulphanilamide levels with lozenges being too low to read, one must infer that a local oral effect is responsible for the results. The amount of the drug—0.065 g.—present in the lozenge, spaced at intervals of an hour, can conceivably produce a bacteriostatic action, particularly in persons of good health. No attempt is made to free the oral cavity of *Str. haemolyticus*. Several questions thus arise. After the initial

two weeks of prophylactic therapy, what is the subsequent course? This remains to be answered, though the companies treated are to be followed up while at Fort Warren. Should a longer period than two weeks be tried? Is there a danger of creating a mass-sulphanilamide-fast organism? Such a possibility, particularly with the pneumococcus, *in vitro* and *in vivo*, has been indicated in a recent report of Schmidt, Sesler, and Deltwiler of Cincinnati, working with mice. Are there intraseasonal variations that may alter the figures offered in this report?

Summary

The incorporation of sulphanilamide in a lozenge offers a means of prolonged medication for such lesions of the mouth and pharynx as are amenable to treatment with the drug.

The results obtained in several hundred cases treated therapeutically and prophylactically indicate that this mode of sulphonamide medication shows promise.

I am indebted to Capt. Paul Schneider, Lieut. Leo Weyerich, Lieut. Walter Schwebel, and Lieut. James Moore for valuable assistance in formulating the statistical data and in observation of the patients treated therapeutically in the dispensaries. Capt. A. Walter Ecklund of the hospital laboratory kindly performed the laboratory work involved in this study.

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HYPOCHROMIC ANAEMIA IN ADOLESCENT MALES

BY

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Nine cases of hypochromic anaemia in adolescent males have been referred to me by military medical boards in Manchester during the past two years. Their ages range from 17 to 19, and they present a striking similarity in their clinical and haematological features. A tenth case, that of a man aged 45, belongs to the same group and indicates the later course of the condition in the absence of efficient treatment. Detailed observation was hampered by the men's unwillingness to lose work by attending for investigation and review. It has been adolescent males receives little emphasis in current textbooks and the routine examination of recruits throughout the country must have revealed a considerable number of similar cases, the following brief clinical report is presented with a view to drawing attention to the condition, which may be more common than is realized.

In each case the anaemia was first noticed in early or middle childhood. Apart from Case 4, the mildest of the series, there is no history of serious illness. None gave a history of haemorrhage, bleeding piles, or jaundice. No family history of anaemia or jaundice was elicited. All the patients had lived a normal life, enjoying the usual boyhood activities, and were following occupations normal to their age without difficulty. Their pallor had been accepted as their natural complexion, and in most cases had not prompted them to seek medical advice. Patient No. 9 (aged 45) did not seek advice on account of his anaemia, which he regarded as trivial and incurable. He had lived an active life as an engineer and was in good general health. His history indicates the benign course of the untreated condition. This man showed good general development, but some of the youths looked small and immature for their age. The majority had not started to shave. None of them were aware of any symptoms of ill-health apart from slight breathlessness in the most severe cases. All professed to having received an adequate pre-war diet, including plenty of meat, vegetables, and fruit. Their post-war diet appeared to be that of the population at large.

On physical examination all the youths had a smooth pale skin with no evidence of jaundice. In four cases the tongue was noted to be smooth; in the remainder its appearance was normal. In nearly all the cases an apical systolic murmur of haemic origin was present. The spleen was just palpable in four cases, and in one, the most severe, was enlarged two fingerbreadths below the costal margin. Four cases showed spoon nails. In one of these the nails were normal and healthy after eleven months' treatment with iron. All but one (Case 10) showed evidence of deficient gastric acidity—complete achlorhydria in 5 cases and marked hypochlorhydria in 4. Table I gives the ages of the patients and the blood counts. Before treatment typical microcytes and ring cells were present and there was considerable anisocytosis with some poikilocytes. Case 5 was the most severe, and showed an unusual number of macrocytes—possibly a response by the marrow to the marked lack of iron. There was no direct evidence of haemolysis, since no case before treatment showed any reticulocyte increase or excess of urobilin in the urine. The serum bilirubin was at the lower limit of normality. The red cell fragility to saline was normal.

TABLE I

Case	Age (Years)	Treatment (Daily)	Period of Treatment	Haemoglobin (% Haldane Scale)		Mean Diameter of Red Blood Cells (microns)		Red Blood Cells (millions per c.mm.)		Leucocytes (per c.mm.)
				Before Treatment	After Treatment	Before Treatment	After Treatment	Before Treatment	After Treatment	
1	19	3 " iron " tablets None	12 months 4 "	56 —	— 110	6·8 —	— 7·2	4·96 —	— 6·6	8,000 —
2	19	6 fersolate tablets 3 fersolate tablets None	15 weeks 8 months 6 "	48 — —	102 116 114	6·8 — —	7·6 7·4 —	3·97 — —	— 6·42 —	5,800 — —
3	18½	3 " iron " tablets	3 "	48	102	6·8	7·4	4·01	5·46	8,000
4	17½	" Iron " tablets, dosage unknown	5 "	72	114	6·8	7·0	4·89	6·47	6,000
5	18½	1½ oz. Parrish's food 6 fersolate tablets 3 fersolate tablets	3 " 5 weeks 6 "	36 — —	46 102 112	7·9 — —	7·6 — —	2·55 — —	3·32 5·28 —	4,300 — —
6	19	—	—	50	—	6·9	—	4·49	—	3,800
7	19	—	—	58	—	6·9	—	5·20	—	5,000
8	19	—	—	48	—	6·7	—	4·34	—	6,800
9	45	6 fersolate tablets	10 weeks	58	108	6·9	7·0	5·61	6·41	8,000
10	17	6 fersolate tablets	5 "	46	100	6·9	7·2	4·71	6·30	5,400

Where treatment could be observed all seven cases responded to iron by mouth (Table I). When we were able to undertake possible, however, to note the effect of treatment in seven of the ten cases. These seven cases all responded fully to adequate treatment with iron. No obvious cause was elicited, and to term the condition " idiopathic " is merely to admit ignorance of their origin. Since this type of anaemia in

treatment personally two fersolate tablets were given thrice daily till a normal count was attained. In Table II the details of the gastric analysis are given.

TABLE II.—*Fractional Test Meals. (Cases 1, 6, 7, 8, and 9 showed complete achlorhydria)*

Case		Specimens (hours)												
		Fasting	¼	½	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3
2	HCl	6	0	0	0	8	9	6	6	14	0	0	0	0
	T.A.	16	8	8	6	12	18	12	18	24	8	8	6	6
3	HCl	0	0	0	0	0	0	0	0	0	0	0	5	12
	T.A.	10	10	10	12	12	10	10	10	12	10	10	32	40
4	HCl	0	0	0	5	0	0	0	0	0	—	—	—	—
	T.A.	5	5	10	20	5	5	5	5	5	—	—	—	—
5	HCl	0	0	0	0	5	5	5	0	0	0	0	0	0
	T.A.	10	10	10	10	20	20	20	15	15	15	10	10	10
10	HCl	32	20	8	15	18	32	35	30	8	0	0	0	—
	T.A.	44	35	26	24	36	48	55	40	26	15	15	18	—

HCl = Free HCl N/10 NaOH (% HCl).
T.A. = Total acidity.

It is of practical importance to determine whether a maintenance dose of iron is necessary when the anaemia has been overcome. These cases have not been observed long enough to determine this point. Patient No. 1 had received no treatment for four months previous to his second examination, when his haemoglobin was 110%. Patient No. 2 had received no treatment for six months previous to his last blood count. During this period the haemoglobin was maintained at a high level (Table I).

Discussion

It is not the purpose of this brief clinical report to discuss the many problems of iron metabolism and its relation to hypochromic anaemia. One or two points are worth emphasis. (*a*) Overt blood loss appears to play no part in the causation of the anaemias. (*b*) Careful inquiry into the diet gave no grounds for supposing that lack of dietetic iron is responsible for the anaemia. In general these men were particularly fond of the iron-rich foods—possibly a compensatory phenomenon. (*c*) The high incidence of hypochromic anaemia in the first few years of life and its comparative rarity in school-children suggest that in the present cases there is a specific deficiency. (*d*) The high incidence of defective gastric acidity suggests a connexion between gastric deficiency and the anaemia.

Summary

A brief clinical report is made of 10 cases of hypochromic anaemia of undetermined aetiology occurring in males. Nine of the cases were revealed by routine examination of adolescent recruits.

Medical Memoranda

Dehydration Fever

Cases of dehydration fever in the newborn are fairly common, but the following case is, I think, almost unique on account of the extreme degree of hyperpyrexia.

Last December I was summoned to attend a baby 3 days old which had been reported by the nurse in charge to have a temperature of 110° F. On arriving at the nursing home I found the infant in a state of extreme prostration; the pulse was weak and uncountable, and the rectal temperature was then 108.4°. This was checked by two thermometers. The child's face and body were almost lilac in colour, the tongue stiff and dry, the lips and mucous surfaces hot, red, and parched.

It was immediately plunged into a tepid bath and after some minutes glucose and saline were run into the rectum (the child being unable to suck). In half an hour the temperature had dropped to 102.4°, and in two hours it had settled at 100.4° F. The baby was by now breathing quietly, his natural colour was restored, and he was able to suck and swallow easily. He is now, ten months later, a fine specimen both physically and mentally.

I do not know how long such a temperature is compatible with life, nor do I know how long the baby had held it before it was first taken. I do know that an interval of 15 minutes elapsed between the recording of the temperature and the institution of treatment.

Swindon. S. MCDERMOTT, M.B., B.Ch.

Reviews

PRINCIPLES OF ORTHOPAEDIC SURGERY

A Practice of Orthopaedic Surgery. By T. P. McMurray, M.B., M.Ch., F.R.C.S.Ed. Second edition. (Pp. 435; illustrated. 30s.) London: Edward Arnold and Co. 1943.

Prof. T. P. McMurray's well-known textbook of orthopaedic surgery makes a welcome reappearance in a second edition. In his preface to this the author states that, though much of the original text has been rewritten and brought up to date and new illustrations have been added, an effort has been made to keep the book, so far as possible, the same size as before. In this object Prof. McMurray has succeeded admirably, and his book is still, as was the first edition, a handy, concise exposition of the basic principles of orthopaedic surgery intended primarily for the young surgeon and senior student. The subject-matter of the various diseases and deformities is clearly set out on a systematic plan with avoidance of too much confusing detail and theory, and under the sections on treatment only those operative procedures which have, in the author's wide experience, given the most consistently satisfactory results are described.

Differential diagnosis of the various conditions is given due weight, though under this heading mention might perhaps have been made of the now proved value of biopsy examination of the inguinal and iliac lymph nodes in tuberculosis of the knee and hip joints respectively. Prolapse of the nucleus pulposus of an intervertebral disc also has acquired so much notoriety of recent years that one wonders it did not find a place in a revised edition of this textbook as a cause of spinal nerve root irritation leading to sciatica, and especially to sciatic and alternating sciatic scoliosis. These, however, are small matters which do not detract at all from the value of an excellent and practical treatise on the principles of orthopaedic surgery in the direct tradition of the great Master of Orthopaedics, to whom the book is dedicated. The young orthopaedic surgeon who bases his practice on the lines so ably laid down for him in this book will certainly have no cause to regret it.

PROCTOLOGY FOR THE G.P.

Proctology for the General Practitioner. By Frederick C. Smith, M.D., M.Sc. Second revised edition. (Pp. 466; illustrated. $4.50.) Philadelphia: F. A. Davis Company.

The most useful chapters in this book, from the point of view of the general practitioner, are those on ano-rectal symptomatology and methods of diagnosis. The author rightly attaches much importance to obtaining a careful history in cases with even minor rectal complaints, and complete routine examination is necessary if mistaken or incomplete diagnoses are to be avoided. The chapters on anaesthesia, parasites, venereal diseases, and constipation are reliable and full of information. The author uses local anaesthesia for minor procedures such as ablation of anal crypts or excision of papillae and thrombotic external piles, but prefers general anaesthesia for what he calls the major rectal operations, such as haemorrhoidectomy, cure of fistula, or excision of pilonidal sinuses. Chapter IX, on anal pruritus, should prove to be particularly helpful to practitioners, and we note that in the author's experience *x* rays and ultra-violet light have not given good results he questions the value of undercutting operations. We might point out that the story of the doctor suffering from pruritus who had to devise a gadget to restrain his hands, which is related on page 235, is repeated almost verbatim on page 241.

For cure of anal fissures the only methods described are divulsion of the sphincter and excision; there is no mention of local treatment for recent superficial fissures. Many of the surgical procedures described cannot be recommended and are contrary to the accepted practice in this country. For instance, five methods of haemorrhoidectomy are described, preference being given to the clamp and cautery operation. In particular we cannot support the author's rather loose description of ano-rectal abscesses and his advice that at the primary operation

the external sphincter may be divided; this is surely bad teaching for the average doctor who has to incise any form of perianal or perirectal abscess. Then again Dr. Smith's description of fistula in ano does not conform with modern anatomical knowledge, and on page 268 he clearly shows less than the average respect for the external sphincter and for the integrity of the ano-rectal ring. Seeing that plastic operations for repair of improperly divided sphincters give such very poor results we think a much more cautious approach would be preferable. There are short chapters on colitis and proctitis. The symptomatology and gross characteristics of carcinoma of the rectum are described, together with Broders's and Dukes's methods of classification. The types of operation in common use are mentioned, but no figures or information as to results are given; this seems a pity, because a book of this sort would provide a means for letting practitioners know how well these cases do on the whole and what an excellent prognosis usually follows radical operation, especially in early cases.

The book bears testimony to the author's great experience in the field of proctology; it is beautifully printed and very well illustrated. The illustrations, by the way, are renumbered afresh with each chapter—a somewhat unusual plan.

DIFFICULT LABOUR

A Handbook on Difficult Labour. By M. L. Treston, F.R.C.S., F.R.C.O.G., Colonel, I.M.S. (Pp. 135. Rs. 5.) Simla: Liddell's Printing Works.

When a teacher expounds his views from a practical experience of some 30,000 cases it is certain that he should have much of interest and importance to say. Prof. Treston's little book of 135 short pages records his teaching on the subject of difficult labour, and he has compressed an amazing amount of instruction into such a small volume. It is dedicated to the staff of the Dufferin Hospital, Rangoon, which, like so many similar hospitals in the East and Africa, has to handle obstetrical problems which are almost unknown in European centres. This and the fact that those facilities which we tend to take for granted here are not always available elsewhere should be remembered by the critical reader. Caesarean section, for example, is obviously considered, no doubt with reason, as being much more of a hazard than it is in a well-equipped unit here. The result is that it was performed but rarely for placenta praevia, which condition was responsible for many maternal and foetal deaths—17% of mothers and 70% of infants.

Prof. Treston teaches that the extended legs in a breech presentation should be brought down when the os is fully dilated—a teaching which is not widely accepted these days. The results quoted are not good, and few readers will criticize the statement that the cause of a high foetal mortality is nearly always unnecessary handling of the child. This is surely a sound reason for leaving the legs alone unless impaction occurs.

The little volume is refreshingly honest and instructive. It reaches us as a second edition because the first was destroyed by enemy action.

ESSENTIAL FIRST AID

Essential First Aid for Quick Reference on the Field. For the Soldier, Home Guard, or Civil Defence Worker who has had an Introduction to the Subject. By Capt. L. C. D. Hermitte, M.B., Ch.B. Second edition. Proceeds from the sale of this folder (6d.) will be given to the R.A.F. Benevolent Fund. Printed and published by Coates and Wilkinson, Ltd., 276, Shalesmoor, Sheffield, 3.

The second edition of this admirable pamphlet on essential first aid for the uninitiated, which follows on the sale of 9,000 copies of the first edition, speaks for itself as to its value to the first-aid worker. It is a concise and sensible disquisition on the elements of first aid, deals comprehensively with all accidents, fractures, burns, wounds, shock, poison gas, etc., and is profusely illustrated as to bandaging and splinting. We note with regret, however, that the first treatment advocated for haemorrhage is the application of a tourniquet before a local dressing is applied to the wound. The pamphlet can be confidently recommended; but, as it is published for the Home Guard and soldiers, the profits on the sale of the second edition might well have been devoted to some military charity.

Notes on Books

A Pocket Medical Dictionary compiled by Miss Lois Oakes in 1933 has now reached a sixth edition (Edinburgh, E. and S. Livingstone; 4s., plus 3d. postage), and her name is associated on the title page with that of Prof. T. B. Davie, who gave much help in the preparation and revision of earlier editions. The booklet is almost identical in every respect with the eighth edition of *A New Dictionary for Nurses* produced under the same auspices and at the same price. The text has been completely revised and so has the guide to pronunciation, of which a copy on cardboard forms a loose bookmark for handy reference. A great deal of information useful to nurses and students is packed into 450 pages.

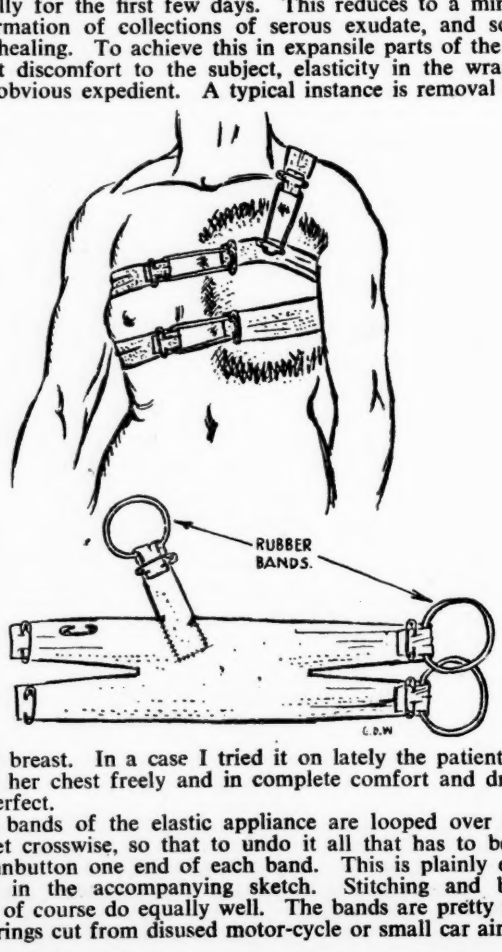
Pugh's Practical Nursing is too well known to need any introduction to the nursing world, and the appearance of its thirteenth edition, in which Mr. W. T. Gordon Pugh is assisted by Miss Alice M. Pugh, S.R.N., is welcome. Changes necessitated by alterations and advances in medical and surgical methods have been incorporated, and there is evidence of careful revision in much of the older material. What is missing is something of the new outlook on the world problem of health and disease as it affects the practice of nursing. The word "rehabilitation" is missing from the index and so are "almoner" and "social medicine." The chapter on children's diseases is too short to do justice to the subject, even for general nurses, and a curious addendum contains monographs on "pink disease," "gold therapy," and "crush injuries." The interspersing of examination questions throughout the text gives an unfortunate impression that the book has been largely based on what the nurse is likely to be asked at her examinations. It would be a good thing if in the next edition they were omitted. Despite these criticisms it can be confidently said that this is a valuable book for nurses. The publishers are William Blackwood and Son and the price is 15s.

Preparations and Appliances

ELASTIC WOUND WRAPPING

Dr. W. Reginald Wilson (Doncaster) writes:

It is a generally accepted principle of surgery that equable pressure should be maintained on and throughout a wound, especially for the first few days. This reduces to a minimum the formation of collections of serous exudate, and so promotes healing. To achieve this in expansile parts of the body, without discomfort to the subject, elasticity in the wrappings is the obvious expedient. A typical instance is removal of the



female breast. In a case I tried it on lately the patient could stretch her chest freely and in complete comfort and drainage was perfect.

The bands of the elastic appliance are looped over safety-pins set crosswise, so that to undo it all that has to be done is to unbutton one end of each band. This is plainly enough shown in the accompanying sketch. Stitching and buttons would of course do equally well. The bands are pretty strong, being rings cut from disused motor-cycle or small car air tubes.

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THE RIVERS OF ENGLAND

The third report of the Central Advisory Water Committee dealing with River Boards[1] gives a full account of the somewhat chaotic state of the conditions under which the various and sometimes conflicting interests of river users are now controlled, and recommends the setting up of a comparatively small number of new Boards with duties similar to those at present exercised by the Thames Conservancy, to whose work the committee pays a well-deserved tribute. It is doubtful if many people realize to what extent the health, comfort, and prosperity of this country depend on its rivers and streams. For example, it is estimated that some three-quarters of the population of England and Wales are supplied with water from rivers, streams, and springs: this alone points to the urgent need for conserving the rivers in both quantity and quality.

It is worth considering the many uses and advantages of rivers and streams, most of which have a more or less direct bearing on health. Of first importance is the provision of water supply, and the water should be pure. Populous areas are able to afford expensive methods of purification which are beyond the means of smaller communities, and the excellent suggestions in the report of the Scott Committee to bring a piped supply of water to all villages call for greater vigilance to ensure a reasonable degree of purity in the streams. It must not be forgotten that, besides providing water supply, rivers are usually the only means of disposal of fouled water, whether it be domestic sewage effluents or trade wastes. To what extent these effluents should be purified before discharging into a river is a matter on which opinion diverges. No one can deny that they should be purified to a degree that would maintain the amenities of the river. This was laid down by the Royal Commission on Sewage Disposal, and there are generally accepted standards of purity based on chemical tests. The question of bacteriological purity is another matter, and the question boils down to this. As only a small proportion of the water flowing down a stream is used for water supply, should a sewage disposal authority be put to the expense of sterilizing the effluent in order that a community drawing their water lower down the stream should reap the benefit? Or should this latter community be put to the expense of sterilizing the water polluted by an effluent discharged higher up the river over which it has no control? The generally accepted answer is that a polluting authority has fulfilled its obligation if it discharges an effluent so far purified that, with the natural purification processes which occur after mixing with the river water, the amenities of the river are not impaired.

But it is not only for providing domestic water that the purity of a river should be maintained. Large quantities are used for industrial purposes, and a considerable degree of purity is required in particular cases. Of almost equal importance is the maintenance of fish life in our rivers. Apart altogether from the food value of fresh-water fish there are the delights of angling. Nearly 400,000 fishing licences were taken out during 1938. Much has been done by existing authorities to preserve the purity of streams, but, alas! there are rivers from which salmon have disappeared because the heavy pollution of the lower reaches prevents the salmon from coming up from the sea to spawn or the young fish from getting back to the sea. In bygone days the Thames was a great salmon river. Besant in *The Fascination of London—the Thames* quotes Strype on the presence of salmon in the Thames: "What should I speak of the fat and sweet Salmons daily taken in this stream, and that in such Plenty, after the time of the Smelt is past as no River in Europe is able to exceed it?" It is said that such was the glut of Thames salmon at times that the apprentices of London had a clause inserted in their indentures that they should not be given salmon to eat more than so many times a week. Now no fish can brave the deoxygenated tidal reaches. In more recent years the Tees has also lost its salmon, and it is a tribute to the work of the West Riding of Yorkshire Rivers Board that salmon can still be caught in the head waters of the tributaries of the Ouse in the ideal surroundings of the Yorkshire Dales, despite the heavy pollutions of the populated and industrialized West Riding. Another function of our waterways is to provide a means of transport for business or pleasure. For all these functions the quantity of water in the river has to be controlled as well as the quality. From the agricultural point of view, flooding must be minimized, and this applies with even greater force to built-up areas.

The committee states in its report that there are at present some 1,600 local authorities, including joint committees, Fishery Boards, and some water undertakings, with statutory powers for the prevention of river pollution. It points out the diversity of interests whose requirements must be considered, the interdependence of the problems that arise, the drawbacks inherent in the existing system of administration, and the need for closer administrative co-ordination. The defects of the system, the committee observes, are most apparent where the mitigation of pollution is concerned. The boundaries of the larger local government areas necessarily bear no relation to watershed areas. The result is that there are many separate authorities with responsibilities for the same river and "a patchwork system of control, with several authorities, possibly with differing ideas of the desirable standard of purity, dealing with one river, or, what is worse, neglect arising from the fact that with so many responsible authorities each authority may be inclined to leave the duty of enforcing the Acts to the others. With divided responsibility, moreover, the failure of one authority to administer the law may well nullify the work of those authorities who take their duties more seriously."

The committee believes, however, that the principal defect of the existing system is not the overlapping functions or the possibility of conflict between interests, but the fact that no single body has the duty to co-ordinate the various river interests or to ensure that the requirements of all such interests are fully weighed when questions affecting the river are under review; the result is that the river is not used to the best advantage of any one of them. It is thought desirable that the number of authorities should be greatly cut down, and that this should be achieved by forming new River Boards which would replace certain of the existing bodies and be vested with their powers and duties. The new Boards should be made responsible for the duties now carried out by Catchment and Fishery Boards and for the administration of the River Pollution Acts, and should be given specific duty in relation to the conservation of water in their areas. The administration area of the new Boards should be the watershed area in the case of larger rivers, or, if financial resources of the areas are not enough to justify the course, two or more watershed areas should be grouped under one Board. The committee considers that the present arrange-

[1] H.M. Stationery Office, August, 1943. (1s. 3d.)

ments with regard to the Thames and Lee are working satisfactorily and should not be disturbed. The formation of 29 new Boards is envisaged, which with those of the Thames and Lee will take over the duties at present exercised by more than 1,600. It is hoped that with larger financial resources the new Boards would be able to maintain full-time scientific and technical staffs to make expert observations and give expert advice; they should be assisted by a central research organization such as that under the Water Pollution Research Board of the Department of Scientific and Industrial Research. These proposals represent a great advance in the management of our rivers, and it is to be hoped that they will be speedily put into force.

MATERNITY SERVICES IN NORTHERN IRELAND

In 1936 the Ministry of Home Affairs in Northern Ireland appointed a committee to examine the organization of maternity services. Prof. R. J. Johnstone was its chairman, and on his death the chair was taken by Prof. C. G. Lowry. The report[1] is dated June, 1939, but its publication bears the date 1943. We are told that the approach of war held it back, and that in the meantime no legislation associated with the report has been introduced. A select committee on public health services is now sitting in Belfast, however, and possibly the problem of maternity services will be freshly reviewed. The Government, with Sir Basil Brooke as the new Prime Minister, is, we are assured, giving earnest consideration to the whole question.

One of the conditions which the committee lays down as essential is the separation of maternity services from Poor Law administration. In Northern Ireland the public midwifery services provide only for the destitute poor. Generally speaking, for the whole population above the status of pauper, midwifery provision in its broader sense is a private matter. Moreover, the services provided for the destitute poor have regard only to the actual confinement. The Boards of Guardians pay such a small salary that the midwife, if she is to earn a living wage, must undertake private practice, with the result that she may be overworked and her non-paying patients may suffer from lack of attention. The average total income of a Poor Law midwife is said to range from £52 to £92 per annum. The question of ante-natal supervision has been tackled systematically only in the city of Belfast, and even there the proportion of women who receive supervision throughout the whole of their pregnancy is small. The committee has no doubt whatever that a high proportion of fatalities in childbirth is the direct result of the lack of such supervision. Strong adverse criticism of the existing system of maternity services was made by the witnesses who appeared before the committee, including the Northern Ireland Branch of the British Medical Association. The committee recommends that the public maternity services be removed entirely from the Poor Law and reorganized under county councils and the corporations of county boroughs; that a Central Midwives Board be set up for Northern Ireland; that a medical superintendent officer of health be appointed for each county to control the entire medical services assumed by the county council, and that in each of the areas the administrative body be required to provide ante-natal and post-natal services, an adequate staff of well-trained and fully paid midwives, a consultant service, institutional facilities, transport, foodstuffs and medicines in necessitous cases, and the disinfection of clothing and bedding. In the opinion of the committee the sum of £180 per annum is the lowest which is likely to attract the type of woman whom it is desired to see employed as a midwife; in addition to the salary, housing accommodation should be provided, together with an allowance towards uniforms. (The Rushcliffe Committee, which recently reported on midwives' salaries in England and Wales, recommended for a district midwife, if she is also a State-registered nurse, a salary of £140, rising by increments of £10 to £200, with, in addition, emoluments of a total value of £100. If she is not a State-registered nurse the salary scale should begin at £120 and have its maximum at £190.) An essential of the scheme for Northern Ireland would be compulsory attendance at refresher courses for midwives at intervals of two years, and midwives should be compulsorily retired at sixty.

Northern Ireland has had a deplorably high maternal death rate. In 1938 the death rate from puerperal sepsis per 1,000 births was 1.20—itself a lower figure than had obtained during the previous ten years—and from other puerperal diseases 4.12, comparing with rates for England and Wales for the same year of 0.89 and 2.19 respectively. In Belfast in 1938 the death rate from puerperal diseases was 5.25. It is a great pity that the committee's report has been held up for four years, and we hope that no similar delay will take place before its recommendations are brought into effect.

[1] Cmd. 219. H.M. Stationery Office, Belfast. (9d.)

CHAIRMANSHIP OF THE COUNCIL

Mr. H. S. Souttar, who had been Chairman of Council of the B.M.A. since the Aberdeen Meeting in July, 1939, made it known that he would not seek re-election this year, and the new Council at its first meeting on Sept. 23 unanimously elected Dr. H. Guy Dain to the chair. In his brief acknowledgment of this well-deserved honour Dr. Dain expressed the Council's sense of obligation to the outgoing Chairman. Mr. Souttar has had no easy task as chief executive officer of the Association during the first four years of the greatest war in history; but his courtesy and good humour never failed him, whether as Chairman of Council, as Chairman of the Central Medical War Committee, or as Chairman of the Medical Planning Commission. An additional service to the profession was his wartime visit to North Africa, Egypt, Iraq, and India as head of a mission sent by the Secretary of State for India at the request of the Government of India, which led to the immediate formation of the Indian Army Medical Corps. The gracing of public ceremonies, for which he is so well fitted, was denied to Mr. Souttar as Chairman of Council; work and care have been his portion. Dr. Dain, with years of experience in leadership behind him, comes to the chair at a critical time, but with the knowledge that he has the confidence of the Association.

SOCIAL WELFARE IN THE U.S.A.

Social welfare in the United States is as earnestly pursued as in Great Britain, and the discussions on health and economic security, industrial relations, public assistance, and family allowances have much the same ring. But on reading more than fifty papers which were presented at a recent conference at New Orleans[1] one is conscious of differences between British and American sociological approach. The Americans are more scientific, more objective, perhaps—if the word is not misunderstood—more business-like in dealing with social problems. Their cases are wonderfully well classified and docketed and supported by statistics. On the other hand, they seem sometimes to

[1] *Proceedings of the National Conference of Social Work.* Selected Papers, Sixty-ninth Annual Conference, New Orleans. (Pp. 681. 33s. 6d.) New York: Columbia University Press; London: Oxford University Press.

be less aware of human factors and psychology. There is something about the very thoroughness with which social investigation is undertaken which makes us admire and at the same time stand slightly appalled. It is an excellent thing to follow up the men rejected by medical boards for selective army service, to pursue them, even across a continent, with forms and bulletins, with permissions signed in triplicate and witnessed, with interviews and referrals, with the ascertainment of financial data and family history, with reports from doctors, dentists, clinics, and community agencies, until the man must feel that the very "Hound of Heaven" is after him. There is a very good chance (a 64% chance according to the figures for one group) that the man will be rehabilitated—unless in the meantime he be badgered to death. One paper, by I. S. Falk, who is the director of the bureau of research of the Social Security Board at Washington, gives a rather subdued picture of the progress made since a five-point health programme was established by an interdepartmental committee of the Federal Government six years ago. He says that there has been no substantial achievement since then in the way of expansion of public medical services or the development of health insurance. Federal aid to these ends has been made available only for a venereal diseases programme. No State has developed a programme for medical care on an insurance basis or any comprehensive programme of public health services. Hospitals have grown in number, but the increase has been mainly in Government institutions, most of which are not available to the population as a whole, and health and diagnostic centres and clinics and out-patient facilities have not substantially improved since 1937-8. An interesting but not too cheerful picture of the United States in its first year of war.

One paper in the collection is by Mr. Malcolm MacDonald, on wartime social services in Britain. Mr. MacDonald paints with a cheerful brush. We wonder how many rescue squads would endorse his remark about air raids that even "when houses get smashed their householders usually escape without a scratch. They emerge hale and remarkably hearty, only they suddenly have no roof over their heads." Again, he describes evacuation as if it were a picnic, with everything in the country garden lovely. Perhaps the transatlantic perspective is needed in order to appreciate how shadowless is the landscape of wartime England.

POLIOMYELITIS

The advancement of our knowledge about poliomyelitis has hitherto been retarded by two special difficulties confronting the experimental investigator. In the first place monkeys are the only readily available animals susceptible to virus from human sources, and even they are relatively resistant to infection. Secondly, many of the crude materials which contain virus are so toxic and so heavily contaminated with bacteria that only small doses are tolerated, and they cannot be administered by the most sensitive—intracerebral—route of inoculation. Isolation of virus from the excreta of cases and carriers and from sewage has therefore been largely a matter of chance. A recent paper by Melnick[1] introduces a method of virus concentration and purification which may eliminate the second difficulty. By means of the ultracentrifuge the virus contained in as much as 30 g. of faeces is obtained in a volume of 1 c.cm., the whole of which can be inoculated intracerebrally into a monkey. Comparative titration experiments indicated that the new method is at least 100 times more sensitive than the best of the older methods. If this is substantiated it represents an advance of great practical importance, because the solution of many outstanding problems depends upon the isolation of virus strains from as many different sources as possible.

The classical conception of poliomyelitis as a disease caused by a single virus, spread by droplet infection, and invading the central nervous system from the nasopharynx via the olfactory bulbs, is no longer wholly tenable. The trend of modern research is to focus more attention on the intestinal tract, both as a portal of entry and as a route of elimination of the virus. Apart from the very frequent reports of isolation from stools, the pattern of virus distribution in a series of fatal cases was considered by Sabin and Ward[2] to point to the alimentary tract as the primary site of attack and to exonerate the nasal mucosa and saliva from participation in virus multiplication and dissemination. Such a view demands a reasonable hypothesis to replace the droplet infection hypothesis. Direct case-to-case transmission presents no difficulty, but how does the virus survive outside the human body during interepidemic periods and how does it regain access to the human alimentary tract? Trask and Paul[3] consider that circumstantial evidence points to some extra-human host in the chain of transmission, and have recorded two instances in which virus was detected in flies collected during epidemics.[4] Most of the available evidence, however, suggests the mouse or other small rodent as a possible reservoir of infection and intermediate host. The mouse appears to be particularly prone to virus infections of the central nervous system, and the naturally occurring mouse encephalomyelitis bears striking resemblances to human poliomyelitis. Moreover, two human strains of poliomyelitis virus have been successfully adapted to mice. On the other hand, the numerous failures to adapt strains to mice should not be forgotten. Recently Jungeblut and Dalldorf,[5] by inoculation of hamsters, cotton rats, and mice, have isolated two viruses during an outbreak of poliomyelitis which involved five cases in a sharply circumscribed area: one was from the cord and medulla of a fatal case, the other from a grey house mouse found dead in the house of the same patient. An important question is whether they can be accepted as true poliomyelitis viruses. All the circumstantial evidence favours an affirmative answer, but the authors themselves realize the risks involved in using rodents for virus isolations. Serum neutralization tests indicated definite relationship with monkey poliomyelitis virus, but much closer affinity to the SK murine strain and to Theiller's mouse encephalomyelitis virus. Perhaps the time is fast approaching when we shall regard poliomyelitis as a clinical entity caused by a number of related viruses, differing both in their antigenic structure and in their range of species pathogenicity, much as we now know to be the case with influenza.

FACTITIAL PROCTITIS

Radiotherapy of carcinoma of the cervix uteri has been so successful as to have become more or less standardized in principle, and it is accepted that both intracavitary radium application and external irradiation by *x* rays are necessary for adequate dosage But since this dosage has been satisfactorily worked out intestinal injuries have been increasingly recognized. A mild acute proctitis is often produced, but it subsides soon after the completion of the irradiation, and the later irradiation reactions—to which the term "factitial proctitis" has been given by Randall and Buie[6]—are unrelated to it. The incidence of these late

[1] *J. exp. Med.*, 1943, **77**, 195.

[2] *J. exp. Med.*, 1941, **73**, 771.
[3] *Amer. J. publ. Hlth.*, 1941, **31**, 239.
[4] *Science*, 1941, **94**, 395.
[5] *Amer. J. publ. Hlth.*, 1943, **33**, 169.
[6] *Amer. J. Obstet. Gynec.*, 1943, **45**, 505.

intestinal injuries is between 3 and 5%, but Aldridge[7] reports intestinal strictures in 16% of 142 cases. There are two main types of injury, aptly termed by Todd[8] intrinsic and extrinsic: the former is limited to the rectum and may resemble an operable carcinoma of the rectum, while the latter presents a massive perirectal fibrosis which may be mistaken for a widespread pelvic recurrence or for an inoperable carcinoma of the rectum. In both types the rectal ulceration occurs on the anterior wall at the level of the cervix and has a radionecrotic appearance, so that it would be natural to regard it as due to an overdose of radiation. But in none of these three reports was there any obvious relation between dosage factors and late intestinal injuries, nor were they associated with the degree of malignant involvement of the parametria nor with the presence of pelvic inflammation. The suggestion made by Hurdon[9] that the lesions are due to endarteritis, and related to the blood supply rather than to the dosage, has been supported by Todd's demonstration that the rectal ulceration occurs in the anastomotic area where an endarteritis would be expected to have maximum effect, and that the perirectal fibrosis—"frozen pelvis"—is almost confined to the posterior segment where the blood supply is poorest. On the other hand, Corscaden,[10] in reporting 15 cases of intestinal injury, had had no further cases since increasing the over-all time of irradiation from 3 to 6 weeks. The ulcer confined to the rectum heals as a rule spontaneously over a period of months, generally without any stenosis and indeed without any residual lesion at all. When there is also perirectal fibrosis, however, colostomy is needed in about one-third of the cases for either stenosis or haemorrhage. Pain is also a prominent symptom, for which Todd advises presacral sympathectomy, because colostomy alone often failed to relieve it. The fatality rate of these late injuries is fortunately small, and one may conclude that the risk of factitial proctitis is a justifiable one to take in attempting to cure cancer.

The incidence of late radiation injuries in the urinary tract is difficult to assess, because similar changes are so often the result of the malignant process itself. Indeed, Ewing[11] stated that the natural termination of most cases of uterine cancer is through uraemia from occlusion of the ureters. Hayllar[12] points out that ureteric obstruction whether due to late radiation fibrosis or to malignant invasion of the peri-ureteral lymphatics with subsequent replacement fibrosis, may occur in patients without recurrence of cancer, and that ureteral drainage and monthly dilatation will permit their survival in comfort for long periods, thus adding a further small percentage to the statistical survival rates.

7 *Amer. J. Obstet. Gynec.*, 1942, **44**, 833.
8 *Surg. Gynec. Obstet.*, 1938, **67**, 617.
9 *Proc. Soc. Radiotherapists*, Oct., 1936.
10 *Amer. J. Roentgenol.*, 1938, **39**, 871.
11 *Neoplastic Diseases*, 1940. p. 619, Philadelphia.
12 *Urol. cutan. Rev.*, 1942, **46**, 617.

TOXIC HAZARD OF BERYLLIUM

Although beryllium, which belongs to the same chemical family as magnesium and calcium, was discovered in 1797, it was very little known before 1916, and has become of prime economic importance only since 1940, chiefly because of its copper alloy, which is extremely resistant to fatigue and corrosion. The principal ore is beryl, a beryllium aluminium silicate, which is widely distributed although rarely in large deposits. Extraction of beryllium from this ore is difficult, necessitating high temperatures and fusion methods, and it is during these extraction processes, especially the fusion of crushed beryl with sodium silicofluoride, that the industrial toxic hazard of beryllium arises. From time to time reports of severe poisoning of workers in beryllium foundries have appeared, but whether the effects were due to the fumes or dust of beryllium or beryllium fluoride, or to other fluorides evolved during the fusion process, has never been definitely agreed.

Among the manifestations of beryllium poisoning have been skin irritation, hepatonephritis, beryllium rickets, and "berylliosis"—the term given to the type of lung damage caused by inhalation of the dust or fumes of beryllium compounds. This condition has recently been observed in America[1] in three workmen employed in extraction of beryllium oxide, and has been described as a "chemical pneumonia." Although no fluoride was used in this particular process, the symptoms and *x*-ray findings corresponded closely with a similar disease described by Gelman[2] as bronchio-alveolitis or peribronchio-alveolitis, and believed by him to be due to fluorine separated in the lungs from beryllium oxyfluoride. The characteristic symptoms and physical findings were dyspnoea, cough with occasional blood-tinged sputum, low-grade fever, shallow rapid respiration, mild to moderate cyanosis, and fine crepitant rales throughout the lower half of both lungs. A radiograph about three weeks after the onset of symptoms showed diffuse haziness of both lungs, prominence of peribronchial markings, soft irregular areas of infiltration, and discrete small nodules. All three patients recovered, the *x*-ray picture being then normal. Since an identical "chemical pneumonia" of undetermined aetiology was also observed in a rayon factory worker, it is suggested that beryllium was not necessarily the direct causal factor in the three cases described.

A still more recent investigation[3] of the action of beryllium on experimental animals appears to confirm the view that it is not itself inherently toxic. Very little beryllium was stored in the tissues of animals which were given large amounts by the mouth, by inhalation, or by intraperitoneal injection, and there was no evidence of "beryllium rickets." Nevertheless, exposure of guinea-pigs and rats to the fumes from the electrolysis of molten fluorides containing beryllium fluoride or oxyfluoride showed that these fumes were decidedly toxic. No specific pneumonitis occurred, but it was believed that the hydrolysis products of the compound were so toxic that the animals died before pulmonary damage could develop. It appears probable, therefore, that the industrial hazard of beryllium arises from the toxicity of its fluoride or oxyfluoride or from the hydrolysis products of other salts rather than from beryllium itself, and that these effects must be taken into consideration in any measures for safeguarding the conditions of preparation of beryllium or its alloys.

1 *Cleveland Clinic Quart.*, 1943, **10**, 10.
2 *Occupation and Health Supplement*, International Labour Office, Geneva.
3 *National Institute of Health Bulletin*, 1943, No. 181, Washington.

The Harveian Oration will be delivered before the Royal College of Physicians of London by Dr. W. E. Hume on Monday, Oct. 18, at 2.30 p.m., at the College, Pall Mall East.

The British Council film, "Surgery in Chest Disease," which was the subject of an annotation in our issue of Sept. 25 (p. 297), will be given a second showing at the Curzon Cinema on Monday, Oct. 11, at 5 p.m. Some seats are still available, and those wishing to take advantage of them should apply to the Film Department, the British Council, 3, Hanover Street, London, W.1. The British Council has very kindly agreed, when prints are ready, to loan the film to B.M.A. Branches and Divisions. It is a 35-mm. sound film, and takes just under 40 minutes to run. We feel sure that many Branches and Divisions will seize the opportunity to see this film of exceptional merit and interest, which has been praised highly by the leading film critics of the country.

NEUROTIC AND PSYCHIATRIC STATES AS CAUSES OF INABILITY TO WORK IN ENGLAND, 1940-1

BY

HOWARD E. COLLIER, M.D., Ch.B.

This study was undertaken in the hope that the statistical material available to me in my capacity as a medical referee to a large industrial insurance society might throw some light on the following points: (1) the actual incidence of neurotic and psychiatric illness in this country at the present time; (2) the relative importance of the "nervous factor" in causing delay in recovery from illness; (3) the probable amount of definitely psychiatric illness present in the community for which specialist psychiatric "treatment" should be provided in a reorganized medical profession.

The Material

With these general objects in view and after a preliminary discussion with Dr. Russell Fraser, who is engaged on the same general problem on behalf of the Medical Research Council, large samples of records made at the time of examination by three medical referees (working independently) for a large benevolent and approved society in the Midland area during the years 1940 and 1941 were analysed. I personally interviewed and recorded the notes of about one-third of the cases; the rest were seen and recorded by colleagues, without whose work the present study could not have been carried out. Series of 500 record cards were taken in alphabetical order from the files of both male and female patients for each of the two years under review—making 2,000 cases in all.

The Analysis

All the clinical notes were read by me and each case was allocated to one of the three clinical groups. (All doubtful cases were classed as physical.) In consultation with Dr. Russell Fraser the following categories were selected.

Group I.—Physical diseases uncomplicated by evident neurosis.

Group II.—(*a*) Physical diseases complicated by "neurotic" symptoms of such a kind or degree as to make it clear that the mental element in the case was significant as a cause of the disability or its undue prolongation. (*b*) Minor or secondary neurosis—i.e., cases in which psychiatric disorder was the main cause of the disability, though often a feature complicating other illness, and treatment was probably simple.

Group III.—Cases of frankly psychiatric origin: that is to say, major psychiatric disability—viz., the psychoses, and also cases probably requiring expert psychiatric attention not within the competence of the ordinary practitioner.

TABLE I.—*Nervous and Psychiatric Illness (Rate per 1,000 Cases in Brackets)*

Description of Material	"Population"	Group II: Neurotic or Psychosomatic	Group III: "Major Neurosis" or Psychiatric	Combined Groups II and III
(1) Cases of "ordinary sickness" seen by medical referees ..	1,693	272 (160)	202 (119)	474 (280)
(2) Analysis according to sex:				
(*a*) Males	809	112 (140)	87 (100)	199 (246)
(*b*) Females	884	160 (190)	115 (129)	275 (320)
(*c*) 1940 males only ..	410	63 (153)	47 (110)	110 (260)
(*d*) 1941 " "	399	49 (120)	40 (100)	89 (220)
(3) Analysis according to age (if recorded):				
(*a*) Males under 30 years ..	176	24 (136)	18 (102)	42 (239)
" over 30 years ..	624	77 (123)	63 (100)	140 (224)
(*b*) Females under 30 years	480	84 (185)	68 (142)	152 (317)
" over 30 years ..	404	76 (188)	47 (113)	123 (304)
(*c*) Males and females:				
Under 30 years ..	656	108 (165)	86 (131)	194 (295)
Over 30 years ..	1,028	153 (150)	110 (107)	263 (255)
(4) Analysis according to marital state (females only):				
(*a*) All single women ..	438	89 (203)	72 (165)	161 (369)
All married women ..	446	71 (160)	43 (96)	114 (256)
(*b*) Single women under 30 years	282	55 (195)	48 (170)	103 (366)
Single women over 30 years	156	34 (208)	24 (154)	58 (378)
Married women under 30 years	198	29 (147)	20 (101)	49 (246)
Married women over 30 years	248	42 (168)	23 (93)	65 (262)
(*c*) Age in 1940 and 1941:				
1940 All single women	235	51 (217)	31 (134)	82 (348)
1941 " " "	213	38 (178)	41 (193)	79 (370)
1940 All married women	207	39 (188)	24 (116)	63 (304)
1941 " " "	239	32 (135)	19 (80)	51 (214)

TABLE II.—*Distribution of "Population" in the Various "Social Classes" (Males only)*

	Social Class i: Managers	Social Class ii: Under-managers	Social Class iii: Skilled Workers	Social Class iv: Semi-skilled	Social Class v: Unskilled
(5) Occupation recorded in 915 cases ..	3 (3·4)	51 (56)	460 (505)	308 (338)	93 (103 per 1,000 examined)
(6) Distribution in standard population*: E. and W. Census, 1931	— (25)	— (142)	— (499)	— (181)	— (167 per 1,000 employed)
(7) Incidence of "nervous disease" according to "social class" (Total, 915)†	1 (—)	11 (—)	83 (180)	65 (200)	15 (160) Total 175 (181 per 1,000 examined)

* All occupied and retired civilian males.

† For this analysis accidents were included to enable a sufficient number of cases to be obtained for analysis. Occupation was not always recorded in the notes made by the referees.

The material was further analysed from a variety of points of view: into the *age groups* in respect of Groups I, II, and III for both male and female cases; in respect of *married or single state* with regard to the female cases only; into *occupation groups* in respect of the male cases only. (It is generally recognized that an occupation analysis of women workers does not yield reliable results.)

It was thence possible to allocate all of the male workers (whose occupation had been recorded) to one of the *five social classes* described by the Registrar-General in his Decennial Report of 1931, and to discover the "general structure" of the population at risk in respect of its economic and occupational conditions. In making this last analysis I used my knowledge of occupations and the names by which workers describe them.

Lastly, by the courtesy of the general secretary of the society some very useful information was obtained concerning the nature of the population at risk, its sex distribution, etc.

The results of these inquiries are summarized in the Tables.

Discussion

The interpretation of these results will depend largely upon the view taken of the degree of artificial selection to which the material is subjected before reaching the medical referee. Something must be said, therefore, concerning the methods and criteria by which the cases are chosen for "reference."

Cases for reference are summoned by experienced non-medical officers of the society: (*a*) because the period of disability is unduly long having regard to the diagnosis (e.g., a cold might be summoned after 3 weeks, but pneumonia only after 3 months); (*b*) because of recurrent trivial illness; (*c*) at the end of 12 months' disablement to ascertain whether the disablement is likely to be permanent; (*d*) cases of accident, suspected industrial disease, vague diagnosis, etc., to "ascertain liability"; (*e*) cases in which sick-visitors consider that alternative light employment might be undertaken. There is a definite tendency, therefore, for "neurotic" cases to be summoned, although some of them no doubt return to work rather than appear before the medical referee. No cases that are unable to travel appear before the medical referee.

It will be seen from Table II (item 5) that the membership of the society is chiefly drawn from the skilled and semi-skilled working groups. (The relative incidence of neurosis in the social classes deserves further study.)

The society consists of two sections: (*a*) the parent society, which is a voluntary benefit society (P), and an approved section, which is a national health approved society (A). A proportion of the members of both sections do not qualify for benefit. These have been excluded from the figures in calculating the population at risk. The two sections of the society (P. and A.) do not differ very greatly in size or sex distribution. The total numbers qualified for benefit (and therefore liable to be summoned to the referee) are 204,674 males and 72,459 females, making a total of over 277,000 members: but of these about 77,000 live too far from the office of the medical referee to be summoned. Hence the *basic population at risk* is about 200,000 persons. It is found that in regard to males, to females, and to the parent and the approved sections, a proportion of *one in three* of the members claim benefit every year. During the year 1940 the society received over 97,000 claims. (In some instances one member may make several claims in one year.) In respect of these 97,000 claims 5,522 persons were summoned to appear before the referee in 1940, and of these nearly 50% returned to work prior to the date of examination. The remainder were seen by the referee,

and constitute the records from which the material studied in this paper has been derived.

Interpretation of Results

The most striking fact about the figures in Table I is their general uniformity and consistency. There was an over-all incidence of 280 cases of all kinds of neurotic disorder in each 1,000 examined. We may conclude, therefore, (1) that about 280 per 1,000 of all cases of unduly prolonged disablement are due to or associated with manifest nervous or psychiatric disease, or that about 280 in every 1,000 disabled persons are likely to experience an *unduly prolonged disablement by reason of "nervous disorders."* (2) In the material surveyed there is a considerably higher incidence of nervous illness among the women than among the men (320:246). It will be noted that this excess is confined chiefly to single women (Table I, item 4) both below and above 30 years of age. (3) Item 7 (Table II) suggests that "social state" is not an important factor in the differential or actual incidence of nervous disorders—at least, in respect of Classes iii, iv, and v. (4) Finally, with all due reserve an attempt may be made to relate the figures to the membership of the society as a whole, and thence perhaps to the community as a whole, since it is improbable that the experience of the community is less favourable than that of a benevolent society of high standing.

Of the patients summoned for examination on account of unduly prolonged illness 50% returned to work before seeing the referees. There are two extreme and opposite assumptions that could be made: first, that in fact the referees saw *all of the cases* whose illnesses were unduly prolonged by "neurosis" and that there was no neurosis among those that returned to work; secondly, that the referees saw *only one-half* of those cases—i.e., only those who did not return to work. In my view it is probable that the truth lies somewhere between these two assumptions. Taking the first assumption, we can estimate minimal, and, taking the second assumption, estimate maximal, rates of the probable incidence of neurotic disorder as a factor in causing unduly prolonged illness in the population.

We know that 5,522 persons were summoned; our analysis shows that 28% of those actually seen were found to be "neurotic." Since the referees saw about 50% of those summoned, we may estimate that *at least* 14% of the persons summoned were "neurotic"—that is, 770 estimated cases. These cases were derived from a total insured population of about 200,000 persons, male and female. Hence we may estimate that neurosis as a significant factor causing prolonged disablement occurs in 3.8 per 1,000 of the population at risk—the members of the society. Since one member in three claims benefit each year, we may estimate that at least 1.2 per 1,000 of the insured population suffer from disabling neurosis each year. Our study showed also that out of 28 neurotics 12 would be classed by me as "psychiatric," as described above. Hence we estimate that at least 1.5 per 1,000 of the insured population require expert psychiatric help.

If we accept the maximum hypothesis, each one of these rates would be multiplied by two. Thus:

7.6 per 1,000 insured persons will be disabled by neurosis
2.4 " " disabled " " " " " "
3.0 " " will require expert psychiatric assistance "

I find that during the last 3 years I have sent patients to psychiatric consultants at a rate of about 1 patient per 1,000 persons for whom I am responsible as a doctor.

ADVERTISING PROPRIETARY MEDICINES

The following rules governing the publication of advertisements for proprietary medicines were unanimously adopted at a recent meeting of the Newspaper Proprietors' Association:

1. No advertisement will be accepted by the newspapers represented in the N.P.A. which offers for sale to the public any medicine or treatment which is directly or by implication held out in terms calculated to lead to the belief that the medicine is effective in:

(*a*) The treatment of Bright's disease, cancer, tuberculosis or consumption, diabetes, epilepsy, fits, locomotor ataxy, cataract, glaucoma, disseminated sclerosis, osteo-arthritis, spinal, cerebral, and venereal diseases, lupus, or paralysis, or for preventing any of those ailments.

(*b*) For the cure of amenorrhoea, hernia, blindness, rheumatoid arthritis, or any structural or organic ailment of the auditory system.

(*c*) For procuring the miscarriage of women.

(*d*) For the treatment of habits associated with sexual indulgence or of any ailment associated with those habits.

2. No advertisement will be accepted from an advertiser who by printed matter, orally, or in his advertisement undertakes:

(*a*) To diagnose by correspondence diseased conditions or any particular diseased conditions in a human being, or to receive from any person a statement of his or any other person's symptoms of ill-health with a view to advising as to, or providing for, the treatment of such ill-health by correspondence; or

(*b*) To treat by corespondence any of the ailments specified in Section 1 above.

3. No advertisement will be inserted containing a testimonial other than one limited to the actual views of the writer, or any testimonial given by a doctor other than a recognized British medical practitioner unless it is manifest that the writer is not a British doctor of medicine.

4. No advertisement will be accepted containing illustrations which are distorted or exaggerated in such a manner as to convey false impressions.

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When minimal tuberculous chest lesions are discovered by radiography we should first make sure that they are progressive or likely to be so and then investigate the conditions of life. The breakdown in health seldom happens without contributory factors, and surgical measures, though valuable, will not replace hygienic precautions and education.—I am, etc.,

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The idea of special centres for the treatment of lupus vulgaris is not new. As far back as the early 1920's the late Sir Norman Walker outlined a scheme for treatment centres to be situated in Edinburgh, Glasgow, Aberdeen, and Dundee. I do not know if his views were published. But I know that at that

and constitute the records from which the material studied in this paper has been derived.

Interpretation of Results

The most striking fact about the figures in Table I is their general uniformity and consistency. There was an over-all incidence of 280 cases of all kinds of neurotic disorder in each 1,000 examined. We may conclude, therefore, (1) that about 280 per 1,000 of all cases of unduly prolonged disablement are due to or associated with manifest nervous or psychiatric disease, or that about 280 in every 1,000 disabled persons are likely to experience an *unduly prolonged disablement by reason of "nervous disorders."* (2) In the material surveyed there is a considerably higher incidence of nervous illness among the women than among the men (320:246). It will be noted that this excess is confined chiefly to single women (Table I, item 4) both below and above 30 years of age. (3) Item 7 (Table II) suggests that "social state" is not an important factor in the differential or actual incidence of nervous disorders—at least, in respect of Classes iii, iv, and v. (4) Finally, with all due reserve an attempt may be made to relate the figures to the membership of the society as a whole, and thence perhaps to the community as a whole, since it is improbable that the experience of the community is less favourable than that of a benevolent society of high standing.

Of the patients summoned for examination on account of unduly prolonged illness 50% returned to work before seeing the referees. There are two extreme and opposite assumptions that could be made: first, that in fact the referees saw *all of the cases* whose illnesses were unduly prolonged by "neurosis" and that there was no neurosis among those that returned to work; secondly, that the referees saw *only one-half* of those cases—i.e., only those who did not return to work. In my view it is probable that the truth lies somewhere between these two assumptions. Taking the first assumption, we can estimate minimal, and, taking the second assumption, estimate maximal, rates of the probable incidence of neurotic disorder as a factor in causing unduly prolonged illness in the population.

We know that 5,522 persons were summoned; our analysis shows that 28% of those actually seen were found to be "neurotic." Since the referees saw about 50% of those summoned, we may estimate that *at least* 14% of the persons summoned were "neurotic"—that is, 770 estimated cases. These cases were derived from a total insured population of about 200,000 persons, male and female. Hence we may estimate that neurosis as a significant factor causing prolonged disablement occurs in 3.8 per 1,000 of the population at risk—the members of the society. Since one member in three claims benefit each year, we may estimate that at least 1.2 per 1,000 of the insured population suffer from disabling neurosis each year. Our study showed also that out of 28 neurotics 12 would be classed by me as "psychiatric," as described above. Hence we estimate that at least 1.5 per 1,000 of the insured population require expert psychiatric help.

If we accept the maximum hypothesis, each one of these rates would be multiplied by two. Thus:

7.6 per 1,000 insured persons will be disabled by neurosis
2.4 „ „ disabled „ „ „ „ „ "
3.0 „ „ will require expert psychiatric assistance "

I find that during the last 3 years I have sent patients to psychiatric consultants at a rate of about 1 patient per 1,000 persons for whom I am responsible as a doctor.

ADVERTISING PROPRIETARY MEDICINES

The following rules governing the publication of advertisements for proprietary medicines were unanimously adopted at a recent meeting of the Newspaper Proprietors' Association:

1. No advertisement will be accepted by the newspapers represented in the N.P.A. which offers for sale to the public any medicine or treatment which is directly or by implication held out in terms calculated to lead to the belief that the medicine is effective in:

(*a*) The treatment of Bright's disease, cancer, tuberculosis or consumption, diabetes, epilepsy, fits, locomotor ataxy, cataract, glaucoma, disseminated sclerosis, osteo-arthritis, spinal, cerebral, and venereal diseases, lupus, or paralysis, or for preventing any of those ailments.

(*b*) For the cure of amenorrhoea, hernia, blindness, rheumatoid arthritis, or any structural or organic ailment of the auditory system.

(*c*) For procuring the miscarriage of women.

(*d*) For the treatment of habits associated with sexual indulgence or of any ailment associated with those habits.

2. No advertisement will be accepted from an advertiser who by printed matter, orally, or in his advertisement undertakes:

(*a*) To diagnose by correspondence diseased conditions or any particular diseased conditions in a human being, or to receive from any person a statement of his or any other person's symptoms of ill-health with a view to advising as to, or providing for, the treatment of such ill-health by correspondence; or

(*b*) To treat by corespondence any of the ailments specified in Section 1 above.

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time he was in frequent consultation with the Scottish Board of Health on the subject. In fact he frequently had members of the Board visiting the lupus clinic between 1919 and 1923, and he induced the Board to authorize public authorities to pay the fares of lupus patients coming to the clinic for treatment.

The idea of a special colony for lupus patients is not new either. In 1922 in a paper prepared for the annual meeting of the British Association of Dermatology I outlined a scheme for a lupus colony, not only for advanced cases but for cases of all ages and at all stages. Through lack of time the paper was not read, but in the scheme I outlined the colony was to be made self-supporting so far as possible.

These patients have a miserable existence. They are frequently economic liabilities, but with proper treatment can be made economic assets. It is more than time that the public —and professional—conscience was awakened to the miseries of their lot.—I am, etc.,

Worksop. ROBERT AITKEN.

Health and Tonsillectomy

SIR,—In your article "Health and Tonsillectomy" in the *Journal* of Sept. 11 it is pointed out that the incidence of naso-pharyngeal disease, otitis media, etc., in the tonsillectomized group was about the same as in the non-operated-on group. Surely this statement proves that the operation has been, to say the least of it, successful, for those who were operated on were children who were much more subject to naso-pharyngeal disease than the average child, and therefore, if they are now as good as the average child, the operation must have done good.

I have been medical officer to two or three boarding schools for 30 years, and it is always a relief to me to find that children have had tonsils and adenoids removed, for in my experience they rarely get mastoids or otitis media. When I began to practise in England in 1906 when tonsils and adenoids were rarely removed I always had on my books 2 or 3 children with discharging ears; for the last 20 years I have had practically none. I think this proves that on the whole this operation has been of great benefit to the community.

Another point in favour of the operation is that I do not see nearly so many cases of catarrhal deafness in the middle-aged.—I am, etc.,

Limpsfield, Surrey. G. D. LAING.

Wartime Diet for Peptic Ulcer Patients

SIR,—Having recently been laid low for four months as a victim of peptic ulcer I have been enabled to view the problem of treatment both as a patient and as a doctor. As a patient I found difficulty under wartime restrictions in obtaining a sufficient quantity of the right types of food to provide a full and varied diet, and I wrote to the Ministry of Food suggesting that various changes should be made, such as the temporary allocation of more "points" coupons. I received a reply to the effect that as the Minister's advisers on invalid dietary had ordained for ulcer patients a priority of three eggs per week and a quart of milk a day no further provision was considered necessary.

Not content with this answer I have reopened the matter with the Ministry and wish to obtain sufficient evidence that a strong body of medical opinion is in favour of temporary food concessions being made for ulcer patients under proper safeguards which the Ministry would devise. My object in writing this letter is to ask all doctors who have had a peptic ulcer themselves during the war to write to me, Dr. J. B. W. Rowe, Kodak Ltd., Harrow, Middx., giving their opinion as to what changes should be made. Opinions from other doctors who have found difficulty in treating peptic ulcer patients owing to inadequate dietary would also be welcomed. I shall then be in a position to present some statistical evidence to the Ministry.

Changes which suggest themselves to me as being desirable are: (1) a substitution of cheese for butcher's meat; (2) a temporary increase of "points" coupons to provide extra easily digestible foods such as cereals, porridge, syrup, etc.; (3) a priority on portable types of food—such as biscuits—so that a patient can always have a few with him and eat them when necessary, since meals at 2 to 3 hours' intervals are so important; (4) a priority for the supply of fish of a suitable type (when there is any) so that the patient's wife does not have to spend long hours in queues and can go home and have her husband's meal ready at the right time.

There is another and very important aspect to this question about which I have already written to the Ministry of Labour, so far with no satisfactory result. A rough estimate of the number of men who are suffering or have suffered (with grave liability to recurrence) from peptic ulcer in the United Kingdom in round figures is 500,000, and I am told by colleagues that there has been a distinct and notable increase in the incidence of peptic ulcer lately. The morbidity is high and lost time amounts to anything from one to six months, and the fact that brain workers are more liable to the condition than manual workers means that key men are the most likely people to be affected, with a consequent greater possibility of industrial disorganization occurring. All this means that every possible step should be taken to cure and to keep people liable to peptic ulceration working, and one of the best ways to do this is to provide sufficient easily digestible food for meals at regular and short intervals.—I am, etc.,

J. B. WRATHALL ROWE.

Recovery of Bladder Function after 21 Years

SIR,—A patient aged 45 was operated on in 1922 by a surgeon who shortly afterwards died. A suprapubic cystotomy was performed, apparently for impassable prostatic stricture. He carried on his work for 21 years with a succession of suprapubic tubes, which he changed for himself. There was no severe cystitis. About April, 1943, great difficulties arose. There was great straining, the tube would not go in properly, and he kept constantly wet. It was also difficult to get action of the bowels. He consulted Dr. Verner of Newport, who sent him to me.

The prostate was very large, and operation was advised. On Aug. 11 the largest prostate I have ever seen—decidedly larger than a coconut—which filled the bladder and blocked the pelvis, was removed. Bleeding was furious, and it was necessary to sew up the prostatic bed completely, and give a large blood transfusion. Three days later a Foley catheter was introduced per urethram without any difficulty, and the thin rubber bulb distended with water between the sutures so as to reproduce a prostatic cavity. There was a secondary haemorrhage a fortnight later, which was controlled without much difficulty. This delayed convalescence, but he passed water naturally at a month, and was practically healed and quite dry when he went home. There was neither straining nor frequency.

It is remarkable that the bladder should recover its function without any hesitation or bungling after so many years. It may be that the enormous size of the prostate is connected with the fact that there was no bladder pressure to control it.—I am, etc.,

Bristol. A. RENDLE SHORT.

Vomiting Sickness in Jamaica

SIR,—In your issue of Sept. 25 (p. 392) there is a letter from Dr. A. A. Wright which would suggest that this malady is a new one. He makes no reference to, in fact appears to be ignorant of, the exhaustive research into this condition by H. H. Scott recorded in the *Ann. trop. med. and Parasit.*, Liverpool, 1916, **10**, 1, under the title, "On the 'Vomiting Sickness' of Jamaica."—I am, etc.,

London, W.1. HUGH S. STANNUS.

Arsenicals in Vincent's Infection

SIR,—The recent article "Misuse of Intravenous N.A.B. for Vincent's Infection" calls for some comment. In the first place the title of the article is ill chosen. Surely it is better that it be headed "The Use of N.A.B., etc.," and further elaboration to show whether that use is justified or not. Such dogmatism is apt to mislead the less experienced and those who, for want of time, fail to analyse the article carefully.

I do not think it is justifiable to label intravenous arsenicals as useless in the treatment of Vincent's infection on the slender and somewhat unreliable and incomplete evidence produced. The "two recent illustrations" quoted are open to serious criticism. In the first case, and in many of the others quoted

the lesions in the mouth developed in the course of treatment with intravenous arsenic for another disease, and after a number of such injections had been given. It is a well-established fact that Vincent's organisms exist in the mouths of healthy people, and only become pathogenic when the opportunity presents itself. Is there not a distinct possibility that they may become drug-resistant and display their pathogenicity in spite of the presence of arsenic? In the second case there was deep jaundice, and it is well known that under such conditions the resistance to infection is considerably lowered.

There must be ample evidence available to show that intravenous or intramuscular arsenicals are of use in the treatment of Vincent's infection. Personally, although I have no actual records by me, I have seen a large number of cases of confirmed Vincent's infection clear up as if by magic after one or two injections. With regard to the expense, it costs approximately 3s. to treat each case, and if Dr. Eric Jewesbury has ever experienced the pain and discomfort attendant upon a large number of local treatments I am sure he will agree that the very remote risk of complications after arsenical injections is well worth taking. It is to be hoped that Dr. Jewesbury will produce some much more convincing figures and cases to show that arsenicals are of no value in otherwise normal cases of proved Vincent's infection, and that, having produced his evidence, he will head the article "The Value of Intravenous Injections of N.A.B. in Cases of Vincent's Infection."—I am, etc.,

JOHN J. DAVIS,
Major, late R.A.M.C. (T.A.).

Basingstoke.

SIR,—A great many dental surgeons will welcome Squad. Ldr. Eric Jewesbury's article (Sept. 18, p. 360) explaining the need for "careful local treatment" and the misuse of intravenous N.A.B. in this disease. It is not exceptional for a dental surgeon, after having set the patient on the right line for complete recovery, to have the patient's confidence in his constructive plan of local treatment—in some cases necessarily laborious—upset by the G.P.'s inadvisably offering the get-you-better-quickly promise of intravenous arsenic.

In the "sore-gum" type of subacute Vincent's disease, and in the very destructive but painless chronic type, total eradication of the infection may entail a great deal of dental reconstruction (as I described in the *Journal*, 1936, **1**, 1104) before every nidus from which recurrent attacks can originate has been eliminated. It is, of course, natural for the patient to grasp at any much simpler and less expensive treatment, but the result of the suggestion that intravenous medication will successfully combat the infection invariably leads the patient to think that there is no reason to fuss with the finicky business of oral hygiene. He therefore relinquishes his efforts to co-operate, and as a consequence his condition deteriorates. It is disillusioning for him subsequently to discover that the intravenous arsenical had done no good, and Dr. Jewesbury's caution that it may indeed do harm is a timely corrective.—I am, etc.,

C. BOWDLER HENRY.

London, W.1.

SIR,—I am impelled to write in relation to possible misconceptions which may arise from Squad. Ldr. Eric Jewesbury's article, which is entitled "Misuse of Intravenous N.A.B. for Vincent's Infection." This article refers apparently to infection of the *mouth* only. Unfortunately the term "Vincent's angina" is used throughout. This term is better restricted to infection of the throat, especially since there can be little doubt (following the work of Dobbs, etc.) that the two infections are aetiologically distinct. "Vincent's infection of the mouth" not being primarily caused by Vincent's organisms, it is not surprising that N.A.B., locally or intravenously, is usually ineffective. Vincent's angina of the throat is entirely different. N.A.B. applied locally is a startling specific for this disease. (It is unnecessary to risk the slight dangers of intravenous use.)

I am appalled at the amount of ignorance which prevails on this subject in some quarters. I have recently seen two cases of quite severe chronic and recurrent Vincent's infection of the tonsils which had been treated in various ways for months without much response. In each case symptoms were relieved after the first application of N.A.B. paint, and healing occurred rapidly. In the last two months I have also treated some nine cases of more acute Vincent's infection in the same way with the same rapid response.

I am not pretending to deduce anything new, but merely wish to point out that local N.A.B. is a well-recognized and spectacularly specific drug for Vincent's angina (of the throat), but it is frequently not being used.

Incidentally the N.A.B. may be used dissolved in glycerin (or Mandl's paint), about 0.5 g. to the ounce. The debris should first be removed from the ulcers with a swab-stick and the paint carefully applied into the base and around the edges of the ulcers.—I am, etc.,

W. P. U. JACKSON, M.R.C.P.

Old Hunstanton.

Arsenical Encephalopathy

SIR,—With regard to the article by Nelson, McGibbon, and Hughes (May 29, p. 661), I read with much interest and some surprise the details of four of their cases of the above complication. I should like to point out that in these days there must be few venereologists who begin the treatment of latent, late congenital, or tertiary syphilis with an arsenical preparation in addition to bismuth. It seems now to be a well-established principle that, in cases of tertiary syphilis, one is wise to start treatment with potassium iodide by mouth, daily, for two or three weeks, followed by a course of bismuth intramuscularly once or twice weekly until ten injections have been given, then small amounts of an arsenical preparation—e.g., neoarsphenamine 0.15 g.—are given intravenously once weekly and the dose gradually increased. The same would apply to a case of late congenital syphilis with a gumma. In latent syphilis one could omit the potassium iodide and commence with a course of bismuth.

Neglect of these precautions is liable, at least in tertiary syphilis, to give rise to serious consequences in the nature of a Jarisch-Herxheimer reaction, which may be fatal if a vital organ is involved. The authors quote four such cases: the first one probably a late latent syphilis (history of penile ulcer in 1910), in which the Wassermann reaction was found to be positive, though clinically the case was one of lymphogranuloma venereum. The second case was one of late congenital syphilis with a gumma (a woman aged 22 years who was 27 weeks pregnant). The third case was a 24-year-old multigravida (32 weeks pregnant) with latent syphilis. The fourth case was one of primary syphilis (a woman 20 weeks pregnant) with a B.P. 150/90 and slight albuminuria following a fit. In each case the treatment was begun with N.A.B. and bismuth. The first three cases died in coma, evidence of haemorrhagic encephalopathy being found at necropsy. The fourth case became comatose shortly after treatment commenced, but eventually made a complete recovery. This last case may well have been an eclampsia or a hypertensive encephalopathy in a pregnancy toxaemia. There was no pathological evidence to support the diagnosis of haemorrhagic encephalopathy, though the latter cannot, of course, be excluded.—I am, etc.,

C. B. AINSCOW,
Capt., R.A.M.C.

Spinal Anaesthesia for Labour

SIR,—It is possible that junior obstetric surgeons reading the article by Dr. Harold Burton on low spinal anaesthesia in labour with cardiac failure may feel tempted to give this method a trial.

I would most earnestly ask that before they do they should read the literature on the subject or even consult the standard textbooks. I feel that even the most superficial acquaintance with the literature on the subject will cause them to reconsider their decision to employ any form of spinal anaesthesia during labour. Furthermore, I am convinced that the giving of a spinal anaesthetic to over 100 normal cases "in order to develop the technique fully" is a procedure which will find little favour with the majority of obstetricians.—I am, etc.,

WILLIAM J. CLANCY,
Obstetrician, City General Hospital, Sheffield.

Register of Medical Auxiliaries

SIR,—The Council of the Board of Registration of Medical Auxiliaries, of which we, the undersigned, constitute the medical members, would very much appreciate the privilege of being allowed through your columns to draw the attention of the medical profession to the objects for which the Board was formed in 1936, and to ask for the full co-operation of the profession in the use of the *Register*.

Medical auxiliary work is taking an increasingly important part in the treatment of disease, yet at present it is open to anyone, qualified or not, to practise this type of work. The purpose of the Board is to provide a *Register* of qualified persons who are guaranteed to have undergone an adequate course of training, passed a recognized examination, and have undertaken to maintain a good ethical professional standard. By consulting the *Register* doctors or members of the public may assure themselves of the training and status of the person whom they employ for medical auxiliary work. The Board itself is a body composed of duly appointed medical practitioners and representatives of each recognized branch of medical auxiliary work. It has provided a standard *Register* of the following groups: chartered masseurs/euses; radiographers; biophysical assistants; dispensing opticians; chiropodists; orthoptists and speech therapists; and can confidently recommend to the medical profession and the public those persons who are on its *Register*. Support has been given us by many hospitals, public bodies, and individual practitioners, but there is need for the whole medical profession to make use of the *Register* if it is to serve to the full the purpose for which it was instituted. Though at present, owing to the war, it is impossible to publish the *Register* in full each year, it is possible to supply any practitioner with the information he may require as to the qualifications of persons on the *Register*. Inquiries should be addressed to the secretary of the Board of Registration of Medical Auxiliaries.—We are, etc.,

V. Zachary Cope (President). L. D. Bailey.
C. B. Heald (Vice-President). E. J. Boome.
L. Vernon Cargill (Treasurer). A. P. Gibbons.
W. McAdam Eccles. Norman C. Lake.
Charles Leonard Gimblett. D. D. Malpas.

B.M.A. House, Tavistock Square, London, W.C.1.

H 11 for Cancer

Sir,—In answer to Dr. G. W. Blomfield's letter (Sept. 25, p. 403) I should like to say that in my series of cases treated by H 11 all case records can be obtained at the hospitals where I have acted as pathologist. I am quite familiar with research procedure as I held a research grant from the B.M.A. for three years at the Middlesex Hospital. Furthermore, I held a research fellowship for one year in Liverpool. Of course a biopsy was taken from my case, and as an added precaution I reported my findings to the late director of the Medical Research Council.—I am, etc.,

Southport. John H. Hannan.

Specialist Courses for Service M.O.s

Sir,—May I say a few words in support of Dr. L. W. Aldridge's excellent letter (July 17, p. 88).

My case must be typical of thousands of Army medical officers and so I make no apology for stating it. After qualifying I spent a year as a general house officer in a small hospital, where I got a "smattering" of all the branches of our art. This served to convince me that my future career lay in the realm of surgery, and I was just beginning to feel my feet when I was called up. Since then for the past 18 months I estimate that I have used a scalpel not more than a dozen times, and then for such minor operations as excision of toe-nails and sebaceous cysts. I well remember after a year in the Army how thrilled I was when some kindly civilian surgeon allowed me to perform a circumcision. I quite realize that in war such a state of affairs is inevitable; young physically fit medical men are not plentiful, and so we must be employed with the fighting Forces in the front line, where there is little opportunity of doing surgery or, for that matter, reading it. Refresher periods at C.C.S. or military hospitals might help a little, but the administrative difficulties of such a policy are very great.

What of the future after the war for us young would-be surgeons? Many of us have married during the war: are we to return to a hospital post at £150 per annum (no hospital will pay us any more with our lack of practical experience for two or three years)? Are we expected to keep a wife on such a salary, or must we take up general practice, for which we have no aptitude and little inclination? Some old stagers may say that it is our own fault for getting married; would they have all Army officers bachelors until after the war? As a last resort a lot of us will refuse to be pushed into general practice by economic necessity; our wives will make the sacrifice, they will forgo a home and children for a few years and continue, if possible, to work; I think that the nation and the profession owe to the men who are fortunate enough to return from active service a better deal than that.

Therefore in these days of talk of rehabilitation let there be some plan for the rehabilitation of the Army M.O. Can something be arranged whereby we can reacquire that knowledge we have lost during the war, so that we can command a reasonable salary in the work of our choice and continue with our clinical aspirations? Let us not be driven into general practice merely to keep body and soul alive. Surely such a state of affairs would produce not only unhappy but bad general practitioners—a most important point at this time, when all our efforts are being directed towards giving the general public a better medical service.—I am, etc.,

E. M. Leyland,
B.N.A.F. Capt., R.A.M.C.

Medical Services for the Merchant Navy

Sir,—As one who has had some short experience of the conditions existing during the present rapid turn round of shipping, may I state my views on this subject. The following points against the present system become immediately apparent.

1. The other Services—i.e., the Navy, Army, and R.A.F.—have a full-time medical service, but except on board passenger vessels the Merchant Navy has not.

2. The other Services have a hospital service; the Merchant Navy has not, and with few exceptions is dependent upon local authority and voluntary hospitals.

3. In the United States there are huge, well-equipped hospitals purely for seamen. The funds for these come from a levy made by the Seamen's Union. (This is a very wealthy union.)

4. In the special conditions prevailing in wartime, ships' companies have to be made up at the last moment, and for this and many other reasons unfit men undoubtedly do have to sail, and even those infected with gonorrhoea have been given a box of sulphapyridine tablets with instructions to the master or chief steward, no doctor being carried in the ship.

5. No one can expect the "Federation doctor" to be able to give a real examination. These doctors are nearly always busy general practitioners, and with the best will in the world they just cannot do it. The notice given them is usually short. I think that in some ports there is no such examination.

6. As a rule there is no record available to a doctor examining a merchant seaman.

I therefore suggest that these objections could be met by some such scheme as the following: A complete separate Merchant Navy Health Service should be established to deal with all questions of seamen's health, including initial fitness for the job on first going to sea; a medical examination before each voyage; a non-infectious illness and accident service in each port or anchorage (a service of this nature has been set up in the Clyde Anchorages Emergency Port); amphibian ambulance service in each port or anchorage; appropriate hospital facilities strategically situated (these could be either *ad hoc* hospitals or, more economically, beds and/or wards set aside in local or E.M.S. hospitals by arrangement with the hospital officer); proper facilities for the treatment of V.D. at all ports. There is also a sound case to be made out for a liaison officer from this force to advise the Board of Trade on the improvement of conditions on board ship.

This medical service would not only examine but also treat seamen. In small ports certain of these duties could be combined with the port medical officer's duties and/or carried out by part-time practitioners. A section should be devoted to research into nutrition, vocational training, and initial suitability for the work. It appears to me that if some such service as this were available (and it is surely not so much more than the other Services already have) then little objection could be raised by seamen to a medical record card, attached to the seaman's own card, which he must already carry. Such a scheme as the above could be financed either purely by the State or by the State along with the Shipping Federation, who so far appear to have shirked their responsibility in this matter.

The favourite bogy of "free choice of doctors" can hardly be produced against a State scheme for merchant seamen, as they have never had this except when on shore for some time.

One of the essential prerequisites of any State medical scheme already exists here, in that all seamen are now "on the pool," and are paid whether at sea or awaiting a vessel.

There is a great deal to be said for introducing some such scheme as this at the present time.—I am, etc.,

Mansfield. W. P. FORREST.

"The Classics"

SIR,—The question whether a knowledge of the classics is helpful to one taking medicine as a career is interesting. Experienced teachers claim that this knowledge leads to clarity of thought and expression, a power of understanding the views of others, and a broader outlook. Undeniably a boy knowing some Latin and Greek will understand, and remember, and spell scientific terms the better for it.

Does not the modern drift from the classics arise more from the way they are taught? as Prof. Major Greenwood suggests. If a boy is making these subjects his life work the system may be defended and the considerable time spent in learning to write in these languages justified. When I was a boy I spent much time in writing what were politely termed "Latin verses" and translating portions of the *Times* into Attic Greek. So that my style should be good, the authors chosen for my reading were selected for the purity of their language rather than the interest they contained.

Supposing a new outlook were taken and boys taught to read rather than write, and the authors chosen for their human interest and modern outlook, I am sure the boy would learn with much more pleasure. Most of us have been "bored stiff" in trying to understand how Caesar built his famous bridge, or Priam harnessed his complicated chariot, whereas we should have enjoyed Pliny giving an eye-witness account of the destruction of Pompeii, or the adventures of Lucian as an "airman." Later in life, when we realized that the medical practitioners in ancient Rome were either slaves or ex-slaves and traced the similarity between the Beveridge report and the idea of "panem et circenses," we should be forced to realize that the Romans (and Greeks) thought much as we do and faced similar kinds of problems.

At 63 I still think a man with even a humble knowledge of the classics "has a little something the others have not got" (to quote a pre-war trade slogan), and is the happier for this.—I am, etc.,

Blagdon, Bristol. W. BALY PEACOCK.

Obituary

G. H. EDINGTON, M.D., D.Sc., F.R.C.S.

We regret to announce that Col. G. H. Edington died on Sept. 24 in the Western Infirmary, Glasgow, where he had been visiting surgeon for many years. He held many important posts, gave valuable service over-seas during the last war, and was a member of the General Medical Council for 12 years.

George Henry Edington, eldest son of G. B. Edington, iron-founder, of Glasgow, was born on Jan. 10, 1870, and after schooldays at Kelvinside Academy studied medicine at the University of Glasgow and at King's College, London. He graduated M.B., C.M.Glas. with commendation in 1891, took the English Conjoint Diplomas in 1896 after proceeding to the M.D. (also with commendation), and became F.R.F.P.S. in 1897; he received the D.Sc. of Glasgow in 1913 and was elected F.R.C.S.Eng. in 1931 without examination. After holding a number of minor clinical and academic posts in Glasgow he was appointed in 1908 to the chair of surgery at the Anderson College Medical School. Five years later he followed the late Sir George T. Beatson as visiting surgeon to the Western Infirmary, and soon afterwards was appointed lecturer in clinical surgery at the University; he was also extra honorary surgeon to the Royal Hospital for Sick Children, and consultant to a number of other institutions. From 1922 to 1927 he was honorary physician in Scotland to King George V. He was a Past-President of the Royal Faculty of Physicians and Surgeons of Glasgow, and represented that body from 1928 to 1940 on the G.M.C. He served for some years as editor of the *Glasgow Medical Journal*.

Col. Edington had a lifelong interest in the Volunteer and Territorial Force movement. He embarked for duty over-seas during the last war as commanding officer of the Lowland Field Ambulance with the 52nd Division, and saw service at Gallipoli and in Egypt; later he was in command of the 78th General Hospital at Alexandria, A.D.M.S. of the Lowland Division, and for a time senior medical officer at a base camp in Palestine. In civil life he took an active interest in the work of the Red Cross Society and became chairman of the Scottish Executive Committee in 1930; the Red Cross movement in Scotland owed much to his enthusiasm. He became a member of the Glasgow University Court in 1939, and in the following year was elected president of the Royal Philosophical Society of Glasgow. He joined the B.M.A. in 1893 and held office as vice-president of the Section of Surgery at the Annual Meeting in Dublin in 1933; he was also a Fellow of the Association of Surgeons of Great Britain and Ireland. During the present war he served on the Scottish Civil Nursing Reserve Advisory Committee and on the Council of the Scottish National Blood Transfusion Association. Some years ago he was appointed a deputy-lieutenant and J.P. for the County and City of Glasgow.

A fellow-member of the Moynihan Club writes:

George Edington had the gifts of geniality and a keen sense of humour, so that he was always a delightful host and a charming travelling companion. I well remember visits with him to surgical clinics in Bordeaux, Prague, Basle, and Zurich. He was full of quaint observations and humorous remarks of what he saw, and in this way always added to the enjoyment of our visits abroad. One would constantly catch a merry twinkle peering through his glasses and a whimsical expression as he chipped one of the party or burst forth in exclamation at some unusual occurrence. In one clinic the French surgeon in charge was performing a long list of operations, chiefly abdominal, and laparotomy disclosed in one case a uterus containing large fibroids. The operator proceeded to remove it, and to our astonishment used a Lawson Tait myoma screw, an instrument which few of us had ever seen at all and still fewer had seen in use. As he twisted the corkscrew-like end into one of the fibroids we heard Edington's whispered remark, "He puts it in like a Scotsman!" Dear George Edington, as he was to his older friends; equally beloved by his younger ones, charming to all. He will be sadly missed from among us. Of his operative work I can say nothing as he was not doing much operating by the time I met him, and his contributions to surgery are too well known to comment upon, but with thoughts of the kind way in which he entertained many of us at his club when we were in Glasgow, of his witty reminiscences of his experiences in the out-patient department of his hospital, and his invariable kindliness and mirthfulness, I would pay a brief tribute to him in these few recollections.

ADAM FULTON, M.B., B.CH.

The news of the death on Sept. 28 of Adam Fulton, at the age of 74, brings back pleasant memories of a man once prominent and greatly liked in B.M.A. circles. After a successful student career in Belfast he qualified as M.B., B.Ch., B.A.O., and settled near Nottingham, where he built up a large colliery and industrial practice. He joined the Association in 1904, and in 1910 came to the Annual Meeting in London as Representative of Nottingham. He continued as a Representative until 1914, was a member of the Council from 1913 to 1920, and a very active member of many committees. In 1920 he accepted an invitation to become a Divisional Medical Officer of the Ministry of Health, and was thus lost to active Association work though always keeping up his membership and his interest in its work.

Fulton was a general practitioner of a very fine type, who secured for himself the confidence and affection not only of his patients but of his colleagues, and both made heavy demands on his energies which were cheerfully accepted. He was very prominent in the struggle over the National Health Insurance Bill, and took a characteristically sane part in the discussions. He was a man of strong moral courage and never concealed his opinion—not too popular at the time—that if the main demands of the profession were met, as they eventually were, the new health service would be a boon to the public and to the profession. He was vice-chairman for some years of the Notts Insurance Committee, and in other ways, both locally and centrally, made his influence so felt that it was no surprise when he was invited to go to the Ministry. I know that his

advice was greatly valued by Smith Whitaker, then the chief medical adviser to the Ministry on the Insurance side, and by Sir Robert Morant, its secretary. Fulton's official duties, which were mainly concerned with Yorkshire, were carried out with his usual tact and sound judgment until the time of his retirement. But to me the quality of the man was best shown during the last war when on his Local Medical War Committee and in co-operation with headquarters he organized the doctors in his district in a way which was not surpassed in any other area. The Notts area was exceptionally heavily depleted of doctors, but Fulton and his colleagues met the situation with great ingenuity and courage, and originated many ideas for the more economical use of doctors, which the Central Medical War Committee was preparing to adapt for use throughout the country if the incessant drain of practitioners into the Army had gone on. The Armistice fortunately intervened.

Since his retirement he had lived in Harrogate, where he continued in a quiet way to make himself useful to his profession and his neighbours. The older members of the profession who knew Fulton would, I am sure, agree with me that it was a privilege to know and work with a man who had such a great fund of common sense and good humour. He was always listened to with great respect in any committee in which he took part. Fulton had no family, but no notice of his career which is more than formal would be complete if it did not mention that he often said that but for his wife's interest in his medico-political work he could never have thrown himself whole-heartedly into work for his professional brethren.

A. C.

A. I. SIMEY, M.D.

The following appreciation of Dr. Simey, supplementing the memoir published on Sept. 11, has been sent by Dr. J. N. Wheeler of Rugby.

A. I. Simey was an instance of all too rare combinations—a first-class classic devoting himself to science and medicine, and again a man with the qualifications and attributes of a first-class consulting physician, imbued with the unselfish motive of love of his old school, of which he had been senior classic and head boy in his time, and drawn by an unalloyed interest in youth, devoting his life to the health of that school as its medical officer. A classical education at a public school and university is a fine preparation for our profession, and there are very many of us who feel that it is a retrograde system which rushes a boy into the precocious specialization of First M.B. work while still in the upper forms of school. The former gives a man the basis of a maturer mind's wider outlook in the choice of a profession, and we should remember that it was only the expected shortage of doctors to fill the demands of Government services which has introduced the element of far too early specialization.

Simey was full of selfless philanthropy in the best sense of the word. Never swayed by selfish ambition, he saw no higher aim than to devote his gifts to the service of the young and of his Alma Mater. He was full of acts of sympathy and kindness to little children, and of friendliness and hospitality to Rugbeians past and present, and in the latter his wife took the share of a true and very gracious hostess. When he came to Rugby and was appointed hon. physician to the Hospital of St. Cross, this voluntary hospital was not yet more than a large cottage hospital of 40 to 60 beds. He left it a thriving and growing general hospital of the smaller class with more than double that accommodation. In this metamorphosis he played a large and untiring part as a member of the Board of Management and of its House and Finance Committee, always taking a very friendly interest in the nursing staff and their health and social activities. He was instrumental with Bernard Relton and others in bringing to birth the Rugby and District Medical Society—a happy social and scientific medical association entirely free from political taint. His wide sympathies made him a most patient and wise counsellor and friend to his colleagues in difficulties arising in practice or in hospital work, and his retirement, forcing him as it did to leave the town and start work as a consultant in the South-Western Counties where he already had connexions, meant a really great loss to the rest of the profession in and around Rugby. As a physician he was a most exact clinical observer and accurate diagnostician, as well as an artist in note-taking. Records meant very much to him in the interests of the after-care of his patients, and when he retired he passed on their dossiers most helpfully to their subsequent medical advisers. He would also feed out whole case sheets to his R.M.O.s by bedside dictation at the hospital. His cultured scholar's mind was helped by a wide range of reading and an exceptional memory for the old classics, which were to him a never-failing source of colour and humour that ran through his thought and talk, his letters to his friends, and even these clinical notes.

He was an expert botanist and a born naturalist ; the birds and the wild flowers were his friends and his hobby. He knew the haunts of rare wild flowers and ferns in many scattered parts of England. As a friend he was as strong as the Northern fells among which he grew and whose height and breadth he loved.

WILLIAM PASTEUR, M.D.

Mr. Victor Bonney writes : In the obituary tributes to the late Dr. William Pasteur his chief claim on posterity—namely, that he discovered, described, and put on the map of medicine for all time the condition known as massive collapse of the lung—is not made clear. I am sure that all those who served with or under him would wish that this, his outstanding achievement, should be permanently associated with his name.

Dr. G. P. Sherwood writes : In the passing of Dr. William Pasteur the profession has lost one of the fast-dwindling members of the top hat and frock coat era who were the pioneers of the profession as it is to-day. Those of us who had the advantage of learning under his tuition must have a sad sense that with him has passed a real friend. To say he had dignity sounds too cold. There was a warmth and kindliness blended with that dignity, a sort of paternal interest that he always seemed to take in his students, that must have left with all of them a life-long affection for " Bill " Pasteur. To this careful teaching and kindly interest many must owe a deep sense of gratitude. There was that in his whole manner, quiet, dignified, and kindly, that only one word, used in its true and unhackneyed sense, can adequately describe, and those students must feel that here has passed a true gentleman and a true friend.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The list printed last week of those upon whom titles of the degrees of M.B., B.Chir. were conferred during July and August was incomplete. The names should read J. Hardy, V. U. Lutwyche, M. Sidgwick, and Mrs. A. B. Willcock.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Arnott and Erasmus Wilson demonstrations and Museum lecture-demonstrations will be given at the College (Lincoln's Inn Fields, W.C.), Monday to Friday, Oct. 18 to Nov. 5. All the demonstrations begin at 4 p.m. and are open to advanced students and medical practitioners.

The Services

Temp. Surg. Lieut. P. R. C. Evans, R.N.V.R., has been awarded the George Medal for gallantry in services to the wounded after his ship had been damaged by an explosion. Enduring great pain, and with both his ankles broken, Surg. Lieut. Evans continued to tend the wounded for many hours.

Temp. Surg. Lieut. R. H. Jones, R.N.V.R., has been awarded the D.S.C. for courage and resolution in enemy coastal waters.

Surg. Cmdr. J. V. Williams, R.N., has been appointed a Commander of the Order of Orange Nassau for services to the Royal Netherlands Navy.

Capt. W. K. MacDonald, R.C.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Sicily.

Surg. Cmdr. W. T. R. Chapman and Surg. Lieut.-Cmdr. S. B. Levy, R.N.V.R., have been awarded the R.N.V.R. Officers' Decoration.

The Order of Polonia Restituta (Officer) has been conferred on Acting Wing Cmdr. H. P. R. Smith, R.A.F., by the President of the Republic of Poland in recognition of valuable services rendered in connexion with the war.

Group Capt. W. J. G. Walker, R.A.F., Wing Cmdr. R. M. Outfin, R.A.F.O., and Squad. Ldrs. M. O. Richardson, R.A.F., P. A. Gimson, and J. F. Houlihan, R.A.F.V.R., have been mentioned in dispatches.

CASUALTIES IN THE MEDICAL SERVICES

Fl. Lieut. Gordon Worsley Bellis, who lost his life on Sept. 17 in a flying accident, was born in March, 1914, studied medicine at Charing Cross Hospital, and qualified M.R.C.S., L.R.C.P. in 1940. After a house post at Ashridge Hospital, Berkhamsted, he was appointed to a commission in the Medical Branch, R.A.F.V.R., on July 25, 1941. At the time of his death he was medical officer to a squadron operating over-seas.

Previously reported missing, believed prisoner, now recorded killed in action, June, 1942.—Major H. M. R. Knight, R.A.M.C.

Prisoners of War.—Fl. Lieuts. D. A. Duthie, R.A.F., F. A. Forbes, C. B. I. Willey, F. R. Philps, A. F. Rutherford, R. R. McSwiney, L. C. Liddell, B. A. Stoll, H. J. Knox, R. G. Blackledge, J. Simpson, P. J. Connolly, B. L. N. Morgan, J. Lillie, F. W. Parke, M. H. Kinmonth, R.A.F.V.R.

Correction.—Capts. (Temp. Majors) A. R. Clarke and W. C. Gledhill and Capt. C. J. Cobbe, R.A.M.C., have been appointed M.B.E. (Military Division) in recognition of gallant and distinguished services in North Africa, and not O.B.E. as stated on Oct. 2, p. 439.

Medical Notes in Parliament

Discussion before the White Paper

Sir E. GRAHAM-LITTLE on Sept. 21 asked the Minister of Health whether he would explain in the forthcoming White Paper that the scope of the discussions he had been conducting with the Representative Committee was limited throughout by the stipulation that negotiations must be based on the acceptance of the decision taken by the Cabinet that a unified health service covering 100% of the population would be instituted, and that its local administration would be in the hands of local authorities under the ultimate control of a Minister who would be responsible to Parliament. Mr. ERNEST BROWN said that while he could not accept all the implications of the question, he agreed that the proposed White Paper reviewing this subject should make clear what preliminary steps (including discussions with the medical profession and others), had already been taken, and in what circumstances.

On Sept. 23 Mr. E. BROWN told Mr. Robert Morgan that a number of other organizations had communicated with him on the subject of a National Health Service besides representatives of the medical profession, local authorities, and voluntary hospitals. He had made it clear, however, that when the White Paper was published he would be ready to receive from organizations and persons interested any representations which they wished to make in the light of their study of it. It would therefore be misleading to publish at the present time a list of those organizations who had communicated with him in advance, other than those whom he especially invited to enter into preliminary discussions.

Nutrition in Newfoundland

On Sept. 21 Mr. ATTLEE told Mr. Parker that he had recently approved proposals by the Commission of Government for launching a special nutrition campaign under the auspices of the Nutrition Council in Newfoundland. An expert dietitian was being engaged for the purpose, and certain other measures recommended by the council—e.g., for the importation of chemically reinforced flour—were also being introduced. It was hoped by these means to bring about a general improvement in dietary habits and to check at the outset the spreading of deficiency diseases, which, notwithstanding improved economic conditions, had lately tended to reappear.

Inoculation against Typhus

On Sept. 21 Sir JAMES GRIGG, replying to Mr. Leach, said that all inoculations in the Army were voluntary. Every soldier now going to North Africa was, however, encouraged to receive this form of protection against typhus, and the majority of the troops in this theatre of operations had been inoculated. This type of inoculation had only been used for a short time, and statistics were not yet available; but experience indicated that it was valuable both in preventing the disease and in lessening its seriousness if it was contracted. Mr. LEACH asked to what experience Sir James Grigg was referring when he said it was justified. Sir JAMES GRIGG: Experience in the pathological laboratories and in the few cases where typhus had appeared.

Medical Care of Civil Defence Casualties

Mr. ERNEST BROWN informed Sir Ernest Graham-Little on Sept. 21 that casualties occurring in Civil Defence units were treated in the same way as casualties in the rest of the civilian population, at first-aid posts and hospitals included in the Emergency Medical Services, which were staffed by experienced surgeons equipped with the latest methods for the treatment of wounds bacterially infected or contaminated by mustard gas or similar gases. In making these arrangements his officers had consulted the Ministry's consultant advisers, the Medical Research Council, and the experts attached to the Ministry of Supply, and the numerous instructions issued to medical staffs of first-aid posts and hospitals were based on their advice. The Bunyan-Stannard envelope method of treatment was available for the use of those medical officers who wished to employ it.

Registration of Older Women

Opening a debate on Sept. 23 on man-power, Mr. ERNEST BEVIN said he had registered every man between 18 and 51 and all women between 18 and 47—10,000,000 men and 10,000,000 women. Of 33,000,000 people between 14 and 64, 22,750,000 were in the Services, Civil Defence, or paid employment. In the country there were nearly 16,000,000 males between 14 and 64, over 15,000,000 of whom were in the service of the country or in paid employment. Of 17,000,000 women between the same ages, 7,750,000 were similarly engaged. Over 1,000,000 other women were doing voluntary work, including nursing. Of single women between 18 and 40, 91% were working. That left only 9% for sickness and various ailments. More than 1,000,000 men and women over 65 were in paid employment. He was unimpressed by the medical arguments against registration of women between the ages of 45 and 50. When he had registered nurses and midwives up to 60 no one made a protest. He recognized that he would have to exercise great care with these women. None of them would be required to live away from home. There would be sympathetic treatment as regards their health and recognition of the difficulties of women in this age group. Sir HENRY MORRIS-JONES said that in women of these age categories inevitable disturbances occurred. The Government should not add anything to their difficulties which could not be proved to be necessary.

When the debate was resumed on Sept. 24, Mr. MCCORQUODALE said that pleas for women between 47 and 50 in respect of physical fitness would be treated sympathetically. Mr. HOLDSWORTH asked if the appeal board would be able to go against a doctor's certificate. Mr. MCCORQUODALE replied that if the doctor's certificate was not clear or if other circumstances presented doubt it might be arranged for the woman to have independent examination, but that was not to be the normal practice. In the main in these age groups a medical certificate would be accepted without hesitation. All the women in these groups would be regarded as immobile; those up to 46 were regarded as mobile.

Dr. RUSSELL THOMAS outlined the symptoms of the physiological and anatomical changes occurring in a woman between 45 and 51. The health fluctuated from week to week, and the question was not one of getting a medical certificate for two or three weeks. Proneness to accident and tendency to suicide were greater at that time of life than at any other. If a woman of that age said she was not up to work she should have the benefit of the doubt.

Shortage of Staff in Hospitals

Mr. MESSER said that, notwithstanding applications to bring hospitals under the Essential Work Order, nothing had been done, and a grave situation was approaching. The Ministry of Health had brought out a scheme to attract people to have treatment for tuberculosis, but wards were closed because there was no staff. At Harefield Sanatorium the domestic staff were in the ratio of two for every 58 patients—70 below establishment. Hillingdon General Hospital was 40 under establishment in the domestic department. He hoped the Minister would not wait for the Hetherington Committee's report before acting. The Middlesex Hospital had required a typist familiar with medical terms. The Minister had confirmed a refusal by the National Service officer to allow such a typist from Essex Insurance Committee to take the job. Yet the local employment exchange provided another typist who knew nothing of medical terms. Special hospital man-power boards might overcome such difficulties. At Clare Hall Sanatorium the pharmacist received his calling-up papers. Arrangements were made for another to take the job, but the Central War Pharmacy Committee said that if the man did so his reservation would be cancelled.

Replying to the debate, Mr. BEVIN said that he hoped to receive the Hetherington report in a few days. When he got it he would try to get the domestic side of the hospital service put right out of the registrations he had made and was now making. He knew that present difficulties reduced the efficiency of the trained nurses.

Notification of Venereal Disease.—Mr. ERNEST BROWN, on Sept. 23, told Lord Fermoy that he was not satisfied that the result of making venereal diseases notifiable would be to help in the control of the disease. He was keeping the mattr under consideration, but there had not yet been time to judge the effectiveness of the measures already taken.

T.T. and Accredited Milk.—The proportions of the total sales of milk in England and Wales which are of tuberculin-tested and accredited standards are 6% and 35% respectively.

No. 37

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Sept. 18.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	44	2	19	4	—	72	4	19	3	3
Deaths		—	—				—	2		
Diphtheria	723	33	176	64	21	878	35	206	65	22
Deaths	9	—	3	2	—	16	1	2	4	—
Dysentery	268	33	88		—	184	16	58		—
Deaths				—	—			—	—	—
Encephalitis lethargica, acute	2	—	—		—	1	—	—		—
Deaths		2					—	—		
Erysipelas		—	55	9	—		—	49	12	—
Deaths		1					—	—		
Infective enteritis or diarrhoea under 2 years				93					116	
Deaths	69	13	18	30	11	69	10	17	27	9
Measles	491	45	36	10	2	2,998	259	127	13	17
Deaths	—	39	—	—	—	4	—	3	—	—
Ophthalmia neonatorum	81	5	19		—	93	3	29	1	—
Deaths										
Paratyphoid fever	8	—	1	—	—	8	—	1	—	
Deaths	1	—	—	—	—	—	—	—	—	—
Pneumonia, influenzal*	365	15	5		—	401	18	4		2
Deaths (from influenza)	9	—	2	1	—	10	2	1	—	1
Pneumonia, primary			167	14				127	9	
Deaths		21		2	10		—		8	7
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	16	—	—	1	1	29	1	1	31	1
Deaths		—					—			
Puerperal fever		—	19		—		—	19		1
Deaths		—					—			
Puerperal pyrexia†	198	10	17	1	1	136	7	9	—	6
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,639	231	339	36	65	1,882	115	351	70	34
Deaths	—	—	—	—	—	—	—	—	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhoid fever	7	—	3	5	1	13	2	3	9	6
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,531	117	221	68	17	1,150	105	55	49	29
Deaths	12	1	1	1	—	9	—	—	2	—
Deaths (0–1 year)	314	48	70	52	27	332	36	56	48	23
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	3,655	590	536	198	113	3,422	461	503	188	111
Annual death rate (per 1,000 persons living)			12·1	13·0	‡			11·3	12·6	‡
Live births	5,902	758	858	417	257	5,861	675	833	443	253
Annual rate per 1,000 persons living			17·5	27·4	‡			17·2	29·6	‡
Stillbirths	197	28	41			206	21	28		
Rate per 1,000 total births (including stillborn)			46					33		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* a further rise occurred in the incidence of scarlet fever, 207, and diphtheria, 23. The notifications of these diseases have increased by 74% and 47%, respectively, since the middle of August. Dysentery and acute pneumonia rose by 67 and 57 cases, and there were 220 and 25 fewer notifications of whooping-cough and measles respectively.

Half the increase in scarlet fever was recorded in two counties—Middlesex 61 and Lancashire 43. The increases in the incidence of diphtheria and acute pneumonia resulted from a small general rise. Whooping-cough was slightly more prevalent in the southern counties; elsewhere notifications were down, the largest decreases being in Warwickshire 61, and in Lancashire 48; the only large increase was in Leicestershire, with 44 more cases than in the previous week. The trend of measles was almost identical with that of the preceding week, the only variation of note being a decrease in Lincolnshire of 44 cases.

There were 67 more cases of dysentery—a large increase for the third consecutive week the cases have exceeded 200. The biggest of the new outbreaks were in Cumberland, Wigton R.D. 48, and in Devonshire, Exeter C.B. 16. A higher incidence was recorded from several areas, the largest returns in these being in Kent 38, Rochester M.B. 26; in Middlesex 26, Ruislip-Northwood U.D. 23; in Warwickshire 17, Birmingham C.B. 14; and thirteen boroughs contributed the 33 cases recorded in London. A total of 22 cases occurred in Hertfordshire, Buckinghamshire, and Bedfordshire, compared with 73 in the preceding week.

In *Scotland* the incidence of measles was down by 51, of whooping-cough by 34, and diphtheria by 4 cases, but there were 36 more cases of scarlet fever. Dysentery fell by 24 cases, and the largest returns were for Dunbarton County 21 and for the cities of Glasgow 20 and Edinburgh 14.

In *Eire* an outbreak of whooping-cough in Co. Galway, Oughterand R.D. 33 cases, was responsible for the increase in this disease.

The Week Ending September 25

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,772, whooping-cough 1,480, diphtheria 757, measles 466, acute pneumonia 356, cerebrospinal fever 49, dysentery 270, paratyphoid 14, typhoid 3.

Medical News

The Harveian Oration before the Royal College of Physicians of London will be delivered by Dr. W. E. Hume at the College on Monday, Oct. 18, at 2.30 p.m.

On the eve of St. Luke's Day, Sunday, Oct. 17, Sir Norman Birkett ("Onlooker"), who has recently paid a flying visit to Africa, will be appealing for medical missions in Africa as the Week's Good Cause at 8.40 p.m. Contributions should be sent to Sir Norman Birkett, at 2, Eaton Gate, S.W.1, marked "B.B.C. Appeal." The preceding religious service, to begin at 8 p.m., will be conducted by Dr. Clement Chesterman, M.R.C.P., who will speak on "Impressions and Experiences of a Medical Missionary in Congo." Dr. Chesterman is the hon. secretary of the British Advisory Board on Medical Missions, and a member of the Colonial Advisory Medical Committee.

A congress on tuberculosis, described as "international," was held at Budapest at the beginning of May under the presidency of Prof. Tomcsik. The chief subject for discussion was tuberculosis in wartime.

The *Klinische Wochenschrift* announces that a central bureau for "childless marriage" has been opened in Vienna. Its function is to assist in every way eugenically sound and childless couples to overcome sterility. If necessary, this assistance may include payments of costs. After the war an institute for investigating human sterility is to be developed from this bureau.

A donation of £5,000 has been given by Imperial Chemical Industries, Ltd., in response to the Oxford University appeal for £250,000 with which to found a department of ophthalmic research.

A new sound film called "Defeat Tuberculosis" has been made at the request of the Ministry of Health by the Ministry of Information. The film, which is intended for exhibition to the general public, stresses the need for seeking treatment early, and illustrates modern methods of diagnosis and treatment of tuberculosis. It is now available for showing to "non-theatrical" audiences. It takes 10 minutes to run, but it cannot be shown on "silent" projectors.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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ANY QUESTIONS?

Postural Dizziness

Q.—*My wife is 66 years of age. She has always been very active, and in fact does a large part of her housework now. When she is up and about she seems quite well, but she gets attacks of dizziness on getting up in the morning, and sometimes on turning over in bed. Once she is up the dizziness passes off in a few minutes. Specialists say that heart, eyes, and ears are all normal. About 30 years ago she had a duodenal ulcer, and still strictly diets herself. She has suffered from no other illness except that she has some fibrositic nodules in the back of the neck.*

A.—Dizziness was defined by Soma Weiss (*J. Amer. med. Ass.*, 1942, **118**, 529) as "an abnormal sensation of unsteadiness characterized by a feeling of movement within the head without the experience of the external world or the patient himself being in motion." In this way dizziness differs from vertigo, in which the patient has the sensation that the outer world is revolving about him (objective vertigo) or that he himself is moving in space (subjective vertigo). True vertigo is always the result of a disturbance of the nervous mechanism involved in the maintenance of normal body balance. Dizziness has a much wider connotation and is frequently a *forme fruste* of syncope. The question suggests that the symptoms in this case are properly called dizziness and that they are related to change in posture. Tests should be carried out to determine whether there is a fall in blood pressure and an increase in pulse rate on rising from recumbency. Nocturnal polyuria and aggravation of symptoms in hot weather would also suggest the possibility of orthostatic hypotension. The symptoms of this condition may be relieved by elevating the head of the bed about eighteen inches. This is accomplished by placing the posts of the head of the bed on ordinary kitchen chairs. Patients sleep comfortably in this position, though some may need a hard pillow under the mattress at the level of the thighs to prevent slipping. Pooling of blood in varicose veins, carotid sinus syncope (ruled out by pressure on the carotid sinus), and spontaneous hypoglycaemia are further possibilities. There are many other conceivable diagnoses, however, and reference should be made to Soma Weiss's review.

Nipples and Breast-feeding

Q.—*The genuine desire of a mother, her nurse, and her doctor to establish breast-feeding is frequently foiled by painful, cracked, or bleeding nipples. What treatment do you advise (a) in the ante-natal period, and (b) after the birth of the child?*

A.—There is no need during the ante-natal period for any special treatment to the nipples if they are normal, except daily washing with soap and water and drying with a rough towel. When the nipples are flat or depressed they should be massaged daily during the last two months of pregnancy with vaseline, lanoline, or witch-hazel cream. Treatment during lactation is essentially prophylactic. The nipples need to be washed night and morning with soap and water. It is important that the mother should wash her hands before putting the baby to the breast. After feeding a sterile piece of gamgee tissue should be placed over the nipples and supported by a well-fitting brassiere. Once a crack develops, feeding from the affected side should be stopped temporarily and one of the sulphonamide ointments applied.

Sternal Puncture in Typhoid

Q.—*What is the value of, and what are the indications for, sternal puncture in a case of suspected typhoid fever?*

A.—It has lately been shown that in enteric fever the typhoid bacillus can be isolated from sternal marrow not only in the acute stage but also for some time after it has disappeared from the peripheral blood,[1] and that the paratyphoid bacillus may be found in the bone marrow of recovered cases in association with abscess formation in the soft tissues.[2] Sternal puncture is not a procedure to be lightly undertaken, and would be indicated in a case of suspected typhoid only when other methods—blood culture, examination of faeces, and Widal reaction—had failed to establish a diagnosis. It is not sufficiently known that with modern selective culture media the infecting organism can be isolated from the faeces in most cases of paratyphoid in the first week of infection, and this probably holds good for typhoid too. In typhoid, particularly, the organism may be recovered from blood clot even in the second and third weeks of infection, so that the separated clot from blood sent for Widal reaction should always be cultured. Sternal puncture may in certain special circumstances be justified for the detection of chronic typhoid carriers.

REFERENCES

1 *Lancet*, 1940, **2**, 169.
2 Macdonald, A., ibid., 1941, **1**, 174.

Transfusion into Bone Marrow

Q.—*On Jan. 10, 1942 (p. 48), you published an annotation on the administration of fluids into the bone marrow of infants. No further reference to this question has been made. I should therefore be grateful if you could elucidate the following points: (1) Why is this method not used far more often? What is its value? (2) Could you give a detailed description of the technique? (3) Can it be used to transfuse blood into the marrow (a) of infants, and (b) of adults?*

A.—The administration of fluids into the bone marrow is not used extensively at the moment for the following reasons: (1) It is not generally appreciated that fluid can be given by this route. (2) Though once learnt the technique of administration is easy, many people hesitate to begin. Its value is considerable for the following reasons: (*a*) It may be extremely difficult in an infant to find the veins, which are small. It is not, however, so difficult to locate either the sternum or the tibia. (*b*) In a patient, for instance, who is severely burnt, it is impossible to find a vein because of the local trauma. Blood, however, can be administered into the marrow cavity through a burnt area. There is no doubt that in many cases this route of administration is life-saving.

A variety of rather elaborate techniques have been described, but the principle is the same. In the case of both children and adults some sort of sedative should be given. A local anaesthetic is then applied over the site of puncture—the tibia probably in a baby, the sternum in an adult—and a needle is passed into the sternal cavity. When in place, this is filled with either normal saline or citrate solution by means of a syringe, and is then fitted to the administering unit for blood, plasma, or saline, as the case may be. In the case of an adult Salah's sternal puncture needle is convenient; in the case of a baby a strong needle of the type used for administering blood intravenously in adults is suitable.

Blood can be readily given into the marrow cavity of infants and adults, and is in fact often administered by this route by those experienced in the technique.

Fusospirillosis

Q.—*Epidemic ulcerative stomatitis recurs in an institution for healthy homeless children wherever previous cases are readmitted from isolation hospitals. Readmissions may relapse into ulceration; most show merely gingivitis, sometimes very limited. Organisms resembling Vincent's are found in healthy mouths. Should isolation hospitals therefore retain hostel cases of stomatitis until gums become clinically normal, which often takes months? And what can be tried for the hostel population besides ascorbic acid, nicotinic acid, individual towels and dishes, and dental and oral hygiene?*

A.—Ulcerative stomatitis is an infective condition of diverse aetiology. The primary infection with the virus of herpes labialis occurs in children as an ulcerative (aphthous) stomatitis, and is undoubtedly infectious. It is probably spread directly by droplets as well as by mediate means, and would be very difficult to control in a residential children's home. Ulcerative stomatitis in which Vincent's organisms are present in large numbers (and a quantitative report on a properly taken smear is essential) is usually regarded as infectious, but requires certain predisposing factors, of which poor dental hygiene is probably the most important. Regular dental inspection with periodic scaling of the teeth (the condition does not occur in the edentulous individual), together with a well-balanced diet to maintain healthy gums and mucous membranes, is the most valuable prophylaxis. This type of infection is most likely to occur in winter and spring, or after outbreaks of colds when resistance is lowered. Cod-liver oil and ascorbic acid are the best vitamin concentrates to use throughout the winter.

A high standard of general and personal hygiene whenever a case or cases occur will help to limit the spread; in particular, every care must be taken to see that children use their own toothbrushes. Drinking-mugs and wash-hand basins must be sterilized between use. It is not customary for patients admitted to isolation hospitals with stomatitis to have mouth swabs examined before discharge, but if the disease is clinically cured it seems unlikely

that the child will carry infection back to the home. Rather, the conditions for the spread of stomatitis are probably already present among the hostel population.

Low Body Temperature

Q.—*To what degree is a low temperature compatible with life or fitness? I had a special thermometer made for a post-influenzal patient, aged 40. She was often doing the housework with a temperature of 91° F. although she said she felt the cold! Once, when she was down to 90.2° F. (I took it myself), she was cyanosed, but only slightly.*

A.—Although it is well known that subnormal temperatures occur during convalescence after many febrile illnesses, and in cases of myxoedema and congestive heart failure, most of our knowledge of the effects of cold on the human body comes from the recent refrigeration studies in cases of carcinoma and schizophrenia. Clinical studies in these cases have shown that normal cellular tissue is capable of withstanding 40° F. for prolonged periods of time without evidence of degenerative changes. The only complication encountered in these subjects after such treatment was an atypical form of circulatory failure, which usually occurred during or immediately after the period when the temperature was restored to normal. Even so, it was extremely rare. Physiological studies show that when the body temperature is reduced there is a fall in the basal metabolic rate. The heart rate tends to become slowed and the volume output is reduced, so that the blood pressure falls. These changes are reflected in the electrocardiogram, which shows abnormalities of the T waves and a prolongation of electrical systole. There is little or no alteration in the blood chemistry or rate of respiration, and no recognizable impairment of renal function.

Psoriasis of Face and Scalp

Q.—*Is there any effective treatment for psoriasis of the face and scalp in a young woman? All the ordinary lines of treatment have proved of little use. The best results have been obtained by exposure to a carbon arc lamp in increasing dosage over a period of years, but even that is now losing its effect.*

A.—The effects of the carbon lamp could be increased by applying an ointment such as the following:

Hydrarg. ammon. gr. x
Liq. picis carb. ʒj
Ung. paraffini (*B.P.C.*) ad ʒj

daily to the patches on the face in the intervals between the light treatments, the ointment, of course, being completely removed before each light treatment. A stronger tar ointment such as picis carb. praep. (*B.P.C.*) 2% in vaseline might be used instead if the first ointment did not prove strong enough. As an alternative to the light treatment, but *not* combined with it, a 100 *r* dose of *x* rays might be given to the affected parts of the face, perhaps twice with a fortnight's interval between doses. This might be combined with the use of the hydrarg. ammon. ointment.

Psoriasis of the scalp requires a stronger ointment such as:

Acid. salicyl. 4%
Hydrarg. ammon. 2%
Oil of cade 12%
Halden's emulsifying base to 100%

This should be rubbed into the scalp night and morning and the head shampooed about twice a week. One or two small doses of *x* rays such as suggested for the face may also be used on the scalp, but the *x* rays must not be persisted in or the hair will fall out.

Preserving Milk

Q.—*I was told by someone who had lived in Africa that many people there added one drop of formalin (liquor formaldehyde) to a pint of milk to prevent its turning sour. We have tried this with excellent results. As some milk is far from fresh and turns quickly sour in warm weather, it is much more palatable with the addition of formalin than after boiling. Is treating milk with formalin in this way safe from a medical point of view, and is there any chemical alteration in the milk? If the method is all right, why has it not been more used?*

A.—The proposed addition of formalin (i.e., a solution of formaldehyde) to milk as a preservative is no new idea, but the revival of a very old and bad one. It was extensively practised in city dairies in the latter part of the last century, and in spite of the adverse comments on it in the report of the Departmental Committee on Food Preservatives, 1901, was not made illegal until the enactment of the Public Health (Milk and Cream) Regulations, 1912, which forbid the addition of any preservative whatever to milk. The addition of formalin to any kind of food is prohibited by the Public Health (Preservatives in Food) Regulations, 1925. Formaldehyde combines with milk constituents and tends thus to be inactivated. If such an excess is present as to achieve the result desired, and there is thus free formaldehyde in swallowed milk, damage to the gastric mucosa must result. It should not be forgotten that an important use of formalin is as a histological fixative: tissues exposed to it are killed and hardened. The degree of such change produced by a small addition to milk would no doubt be slight, but the possible deleterious effects of long-continued consumption of such milk can well be imagined, and fully justify the prohibition of its use.

The Injured Diabetic

Q.—*In an official A.R.P. handbook, with reference to the disposal of diabetic patients from an "incident" we are advised: "If the patient is uninjured and still conscious, he should be given a sugared drink and sent to hospital as soon as possible. If the patient is unconscious, he should on no account be given a sugared drink but must be transferred to hospital at once." What is to be done in the very likely case of the diabetic patient who is injured and still conscious?*

A.—If the diabetic is uninjured and conscious, do nothing and send him home, as he is very unlikely to develop hypoglycaemia. If the diabetic is unconscious I agree that he should not be given a sugary drink, as it might get into the lungs. If facilities are available, 20 c.cm. of a 25% solution of glucose should be given into a vein to make certain that the coma is not due to hypoglycaemia; the patient should then be sent to hospital. If the diabetic is injured, deal with him like any other injured patient, as he is very unlikely to be suffering from hypoglycaemia.

War against Fleas

Q.—*As in each September, fleas are now more active and numerous, but this year seems an exceptionally bad one. Many preparations formerly used for the control of dog and "human" fleas appear to be off the market. Pyrethrum is said to be the active ingredient in the vegetable types of powder. What is the important constituent of the mineral types, as used for animals? Are these agents, or an effective substitute, obtainable now?*

A.—The best remedy for cat and dog fleas is a fine derris powder rubbed into the fur. But this, like pyrethrum, is unobtainable at present for this use. A mineral insecticide sometimes used is powdered naphthalene, which may, however, make the animal sick for a time. An alternative to powder dressings is a hot bath with a good carbolic soap used freely. The last treatment, with a change of clothing, is effective for people infested with human fleas. With all types of flea attention should be paid to the breeding site, which is usually close to the sleeping place of the host. Thorough sweeping and scrubbing will clear away the larvae, and flake naphthalene can be scattered in difficult places. Human fleas, curiously enough, often breed in pig-sties, and cottages are sometimes infested in this way. The treatment then is to clear the sties and spray their floors with tar oil emulsion.

LETTERS, NOTES, ETC.

Inflammability of Trichlorethylene

Dr. C. LANGTON HEWER writes: In a paper read in May before the Anaesthetic Section of the Royal Society of Medicine I stated that "trichlorethylene vapour will not burn or explode if mixed in any proportion with air, oxygen, or nitrous oxide." It appears, from research work recently carried out by the Bureau of Mines, Pittsburgh, U.S.A., that this statement is only true if the temperature does not exceed 25.5° C. (78° F.). At higher temperatures, if the drug is mixed with air enriched with oxygen or with pure oxygen, inflammable mixtures can under certain conditions be obtained. So far as I know there are no data relative to the inflammability of nitrous oxide–oxygen–trichlorethylene mixtures at high temperatures, but the matter is being thoroughly investigated by I.C.I. Ltd. Pending the publication of this report, it would seem wise to use trilene and air mixtures only, if there is any risk of a source of ignition coming into contact with the anaesthetic gases.

Prevention of Midge Bites

Dr. H. M. DENHOLM-YOUNG (Farningham, Kent) writes: Give an average-sized adult one dose of ephedrine hydrochloride gr. 1 and there will be no midge bites (or at least no sensation of bites and no lumps) for about 2 weeks. Be sure that the blood pressure is not high, because this causes one night of misery even in a normal adult—a feeling of intense excitement.

Correction

The second sentence of the news item on the employment of nurses (Oct. 2, p. 440) should read: "Employers will not be able to engage a nurse except through an appointments office unless they possess an exemption certificate." It may be added that a condition of the issue of these certificates to employers (hospitals) is that the approval of the Ministry of Labour must be obtained before an appointment is finally made.